FLEET OWNER

DEVOTED TO THE BETTER OPERATION AND MAINTENANCE OF ALL AUTOMOTIVE FLEETS

Vol. 32 February 1944 No. 2

FEB 12 1944
DETROIT

,000 Mickey Finns for the Axis

ORLD'S LARGEST COCKTAIL SHAKER," they call huge truck-tanker . . . one of a large fleet of Super er Whites hauling grain alcohol from several midwest lleries to ordnance plants—they are the first trucks orized by the U. S. Treasury Department to transport hol under bond. An armed guard accompanies each and each load is bonded for $200,000.

wartime trucking service recommended by the Office Defense Transportation to help relieve the rail tank hortage, has been markedly successful. In one instance, five trucks hauling from a Kentucky distillery to a munitions plant in Indiana have released 75 rail tank cars a week.

This is only another example of the wartime importance of trucks. If you own a White, ask your local representative about White *Personalized Service*. If you own any make, our conservation facilities are at your call.

THE WHITE MOTOR COMPANY
Cleveland, Ohio, U. S. A.

White

R MORE THAN 40 YEARS THE GREATEST NAME IN TRUCKS

From A to Z

DO THE JOB RIGHT!

12*th* **of a Series on "Right Ring Installation"**
dedicated especially to helping new mechanics meet their war-time responsibilities.

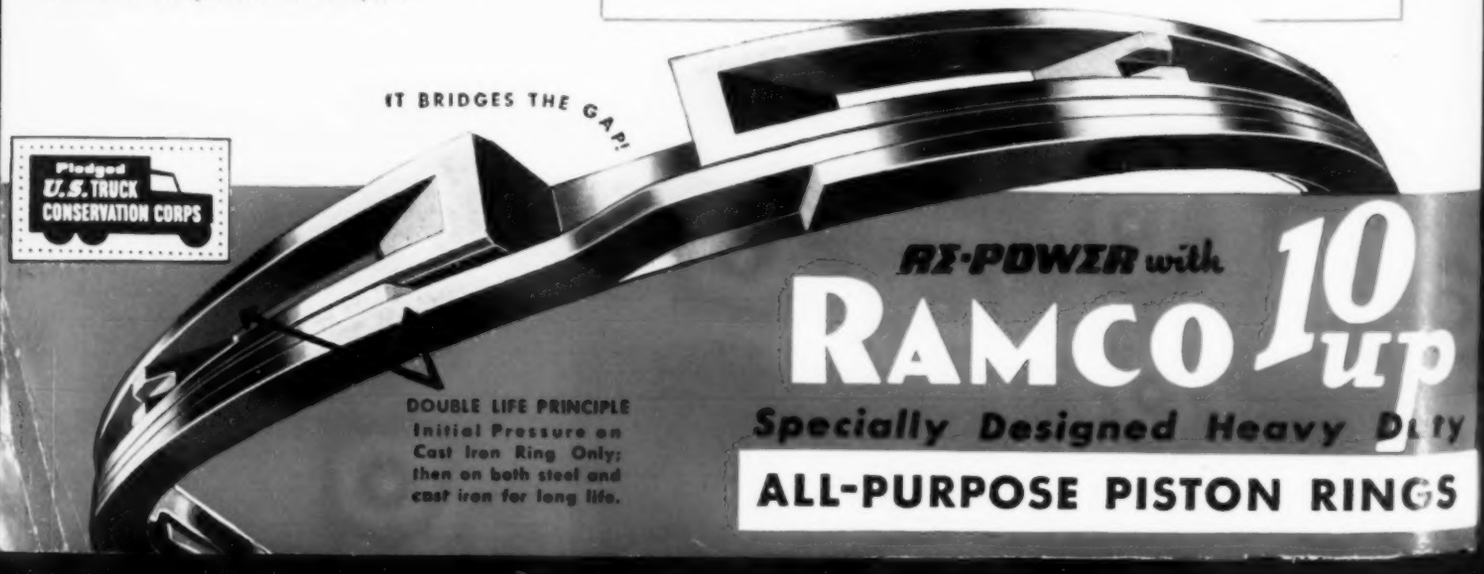
TWELFTH STEP . . . after the pistons with new rings are in place, new gaskets installed and the head in position, extreme care should be taken in tightening the cylinder head bolts to manufacturer's specifications. Always use a torque wrench and be sure to start at the center, work half way around and then the other half as shown in above diagram. Don't try to pull down to full pressure all at once . . . take it gradually. This is important to prevent distortion of the cylinder head block and cylinder walls thereby insuring that the rings will maintain contact with the cylinder walls at all speeds.

Doing the job right in engine re-conditioning means using all of the latest and most approved ring installation procedures and making absolutely certain that the rings you select are right for the job . . . right in design . . . right in precision!

You can be absolutely sure when you use Ramco 10-Up rings! Because they do not depend upon high, harsh steel wall pressures to control oil and blow-by . . . you can use them with equal success for both re-bores and re-ring jobs.

Think of Ramco 10-Up as an original equipment type ring with the extra ability to compensate for wear as it exists or develops!

So try Ramco 10-Up in your next job . . . and send today for the **Free Ramco War-Time Ring Installation Manual** that will enable you to make sure your installation procedures conform with the latest approved practices. Write Ramsey Accessories Mfg. Corp., 3713 Forest Park Blvd., (8), St. Louis, Mo. In Canada, 364 Richmond St., Toronto.


IT BRIDGES THE GAP!
Pledged U.S. TRUCK CONSERVATION CORPS
DOUBLE LIFE PRINCIPLE
Initial Pressure on Cast Iron Ring Only; then on both steel and cast iron for long life.
RE-POWER with
RAMCO 10 up
Specially Designed Heavy Duty
ALL-PURPOSE PISTON RINGS

Keep your Fleet Sailing with
SEALED POWER
PISTON RINGS
26 Basic Designs
Not 2, not 6 but 26 basic designs of rings have been developed by Sealed Power engineers for use in Individually Engineered Ring Sets. The set for each particular type and make of engine contains rings that have been specifically engineered to do the best possible job in that engine. Sealed Power has been refining these sets for more than five years and has been producing rings for car, truck, and engine manufacturers for more than thirty years. For best results, repower with Sealed Power motor parts. Sealed Power Corporation, Muskegon, Michigan and Windsor, Ont.
Piston Rings, Pistons, Cylinder Sleeves, Piston Pins, Valves, Water Pumps, Bolts, Bushings, Tie Rods, Front End Parts
SEALED
POWER
RING SET
INDIVIDUALLY ENGINEERED
SEALED POWER
PISTON RINGS
BEST IN NEW CARS! BEST IN OLD CARS!

SOFT PRESSURE DOES IT

The greatest need today is to save cylinders. So we build Steel-Vent piston rings on the principle that checks cylinder wear—the *Soft Pressure* principle.

You can prolong engine life and also step-up performance by using Soft Pressure—with Hastings Steel-Vent "motor engineered" sets.

They're a favorite ring with bus and fleet operators because they're the right ring for every cylinder condition from rebores and re-sleeves to extreme tapers.

HASTINGS MANUFACTURING COMPANY · HASTINGS, MICHIGAN

Hastings Mfg. of Canada, Ltd., Toronto

★ *It's a privilege to buy War Bonds*

HASTINGS

STEEL-VENT PISTON RINGS

U. S. Patent No. 2,148,997

Tough on oil-pumping · Gentle on cylinder walls

In war or peace
B.F.Goodrich
FIRST IN RUBBER

The tire that eats bullets

A typical example of B. F. Goodrich development in rubber

THOSE jagged holes were made by machine gun bullets that went right on through. But the tire didn't go flat!

It's a combat tire, used on army trucks, gun carriers, scout cars, and other vehicles which must travel under fire. While regular B. F. Goodrich truck tires were sturdy enough to take on most army jobs, they always went flat when hit by rifle and machine gun bullets. The army wanted tires that wouldn't.

Rubber engineers working with military technicians developed a new kind of truck tire—a combat tire which had the ability to keep on running long after it was punctured. Combat tires, as made by B. F. Goodrich, have two lives. Under ordinary conditions the air in the tire carries the load, just as it does in any truck tire. When hit by a bullet, the extra-thick sidewalls take over the job. Even with air gone, the tire itself will support the load and run for 40 miles before going flat.

Because of the need for these special combat tires and other tires for military use, tires for civilian trucks and cars are scarce. Practically all tires being produced by B. F. Goodrich today are made wholly or partially of synthetic rubber. Those for passenger cars, with good care, will nearly equal the service of prewar tires. Truck tires are not yet as well perfected, particularly for intercity service, but are being improved. And they are keeping America's trucks rolling.

When next you buy truck tires, see the B. F. Goodrich dealer or Silvertown store.

B.F. Goodrich
Truck & Bus Tires

FLEET OWNER, February, 1944, Vol. 32, No. 2. Published monthly by the Ferguson Publishing Co., 90 West St., New York 6, N. Y. Subscription price $3.00 per year in the United States and Canada. Single copies 35¢. Acceptance under the act of June 5th, 1934, authorized April 24th, 1941.

IT'S

A 145-TON coast defense gun makes a whale of a load even for this 38-wheel tractor and double trailer.

In moving extra-heavy loads of all kinds, riggers and heavy-duty truck operators are assured successful performance of wheel bearings, by lubricating with *Texaco Marfak Heavy Duty.*

Texaco Marfak Heavy Duty provides a tough film that clings to the metal... resists squeeze-out. *Marfak Heavy Duty* stays in the bearings — off the brakes — winter and summer. No seasonal repacking required.

For chassis parts and steering connections ... *Texaco Marfak.* It provides ideal film lubrication inside a bearing, yet maintains its original consistency at the outer edges... sealing itself in, sealing out grit and water.

Texaco Lubrication Engineering Service is available to you through more than 2300 Texaco distributing points in the 48 States.

☆ ☆ ☆

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TUNE IN FRED ALLEN EVERY SUNDAY NIGHT — CBS

LOADED!

THEY PREFER TEXACO

★ More locomotives and railroad cars in the U. S. are lubricated with Texaco than with any other brand.

★ More revenue airline miles in the U. S. are flown with Texaco than with any other brand.

★ More buses, more bus lines and more bus-miles are lubricated with Texaco than with any other brand.

★ More stationary Diesel horsepower in the U. S. is lubricated with Texaco than with any other brand.

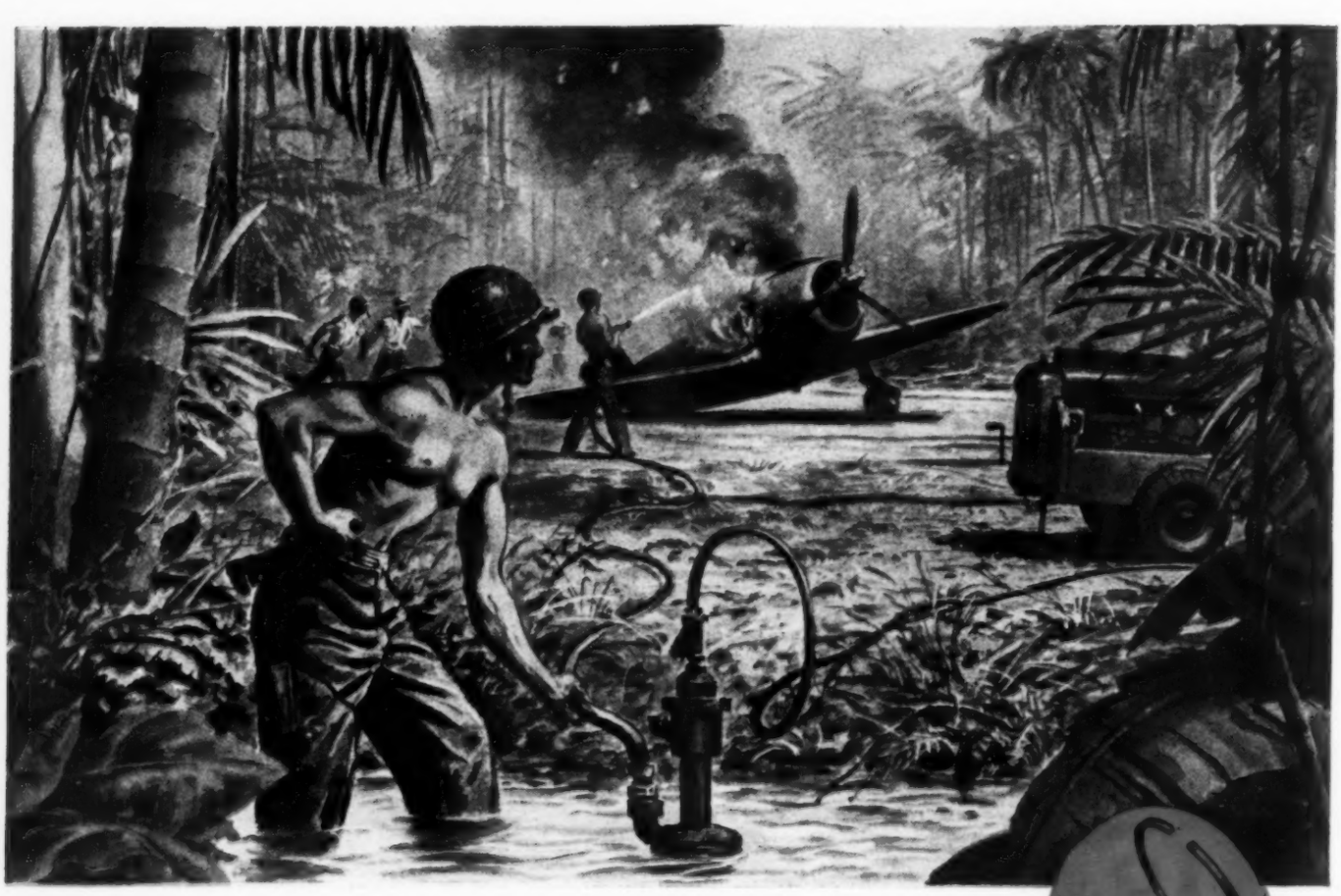
★ More Diesel horsepower on streamlined trains in the U. S. is lubricated with Texaco than with all other brands combined.

TEXACO

REG. T.M.

TEXACO MARFAK

HELP WIN THE WAR BY RETURNING EMPTY DRUMS PROMPTLY



PEDRICK PRECISION *rings the bell!*

WHEN PORTABLE COMPRESSORS PLAY VOLUNTEER FIREMAN . . .

● Among the many roles played by portable compressors in this global war, is fire-fighting. Even the most isolated posts get quick and dependable relief from fires kindled by enemy raids because these units draw water from any source and deliver a strong, steady stream to the flames.

In many of these compressors, dependability is assured by Pedrick *precisioneered* piston rings. They have correct and lasting tension, absolute flatness and true shape because of Pedrick's patented processes of double-disk grinding and Heat Shaping.

Not only on innumerable war fronts, but on every home front where internal-combustion power or pressures must be kept at top efficiency in spite of overloads, over-age and over-hours, PEDRICK piston- and sealing-rings are easing the burdens of the Nation's service and maintenance men. WILKENING MANUFACTURING CO., Philadelphia and Scranton, Pa. *In Canada:* Wilkening Manufacturing Co. (Canada), Ltd., Toronto.

THE POWER TO WIN IS IN YOUR HANDS

The engine is the heart of motor-transportation. Never before was it so important to keep engines in perfect running condition by using the most efficient parts and doing the service work properly. One sure way to prolong engine-block life, save oil and gas, and your mechanics' time, is to use Pedrick Engineered Sets of compensating piston rings on reconditioning jobs. See your Pedrick jobber for *precisioneered* rings and labor-saving service information.

KEEP ON BACKING THE ATTACK WITH WAR BONDS

Pedrick

precisioneered PISTON RINGS

Truck Tire Tips

ON

PROPER TIRE REMOVAL

1. Deflate the tube and loosen beads from rim flange with tire tools. (Even after short service tire beads become stuck to rim flanges.)

2. Remove locking ring by inserting tire tool in the notch provided for that purpose. Stand on the ring directly opposite notch.

3. Pry flange off a little at a time, moving the tire tools only a few inches each time a portion is loosened. This procedure will prevent bending the flange.

4. When the flange is removed, turn the wheel over and place on blocks, allowing the tire to drop on the ground as shown in this illustration.

IMPORTANT

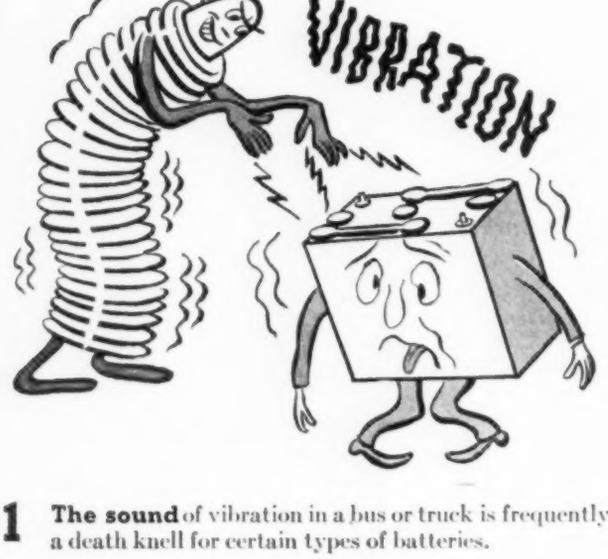
New 24-page book showing 16 causes of premature truck tire failure and how to overcome them. Write Miller Tires, Akron, Ohio or Los Angeles, Calif. for your free copy.

MILLER

"HEAVY SERVICE" TRUCK TIRES

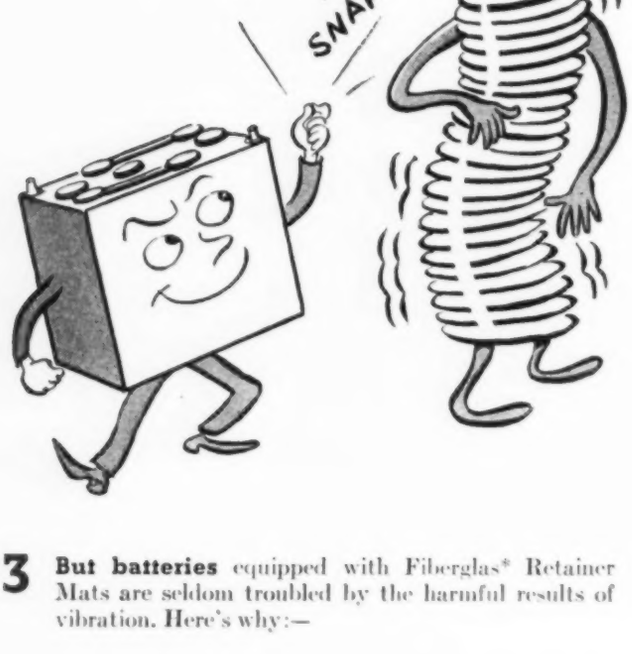
MILLER

Why some Batteries dread this doleful sound



1 **The sound** of vibration in a bus or truck is frequently a death knell for certain types of batteries.

2 **This is** because vibration accelerates the shedding of the active material from the positive plates—shortens battery life.



3 **But batteries** equipped with Fiberglas* Retainer Mats are seldom troubled by the harmful results of vibration. Here's why:—

4 **These mats** hold the active material in place on the positive plates (see above). Batteries so equipped last up to twice as long, according to impartial tests conducted to meet S. A. E. specifications.

In addition, Fiberglas-equipped batteries have excellent cold-starting characteristics and higher average output during their longer life.

Today, Fiberglas-equipped batteries are seeing service on many fronts . . . in armored cars, trucks, tanks, and submarines. So, when your batteries need replacing, remember these facts about the stamina and dependability of Fiberglas-equipped batteries. You will find many nationally advertised batteries are now equipped with Fiberglas Battery Retainer Mats.

Owens-Corning Fiberglas Corporation, Toledo 1, Ohio.
In Canada, Fiberglas Canada, Ltd., Oshawa, Ontario.

ARMY E NAVY

FIBERGLAS
*T.M. Reg. U.S. Pat. Off.

BATTERY RETAINER MATS

CHAMPION SPARK PLUGS

KINGAN'S RELIABLE

KINGAN & CO., PORK AND BEEF PACKERS

INDIANAPOLIS

Champion Spark Plug Company June 10, 1943
Toledo, Ohio

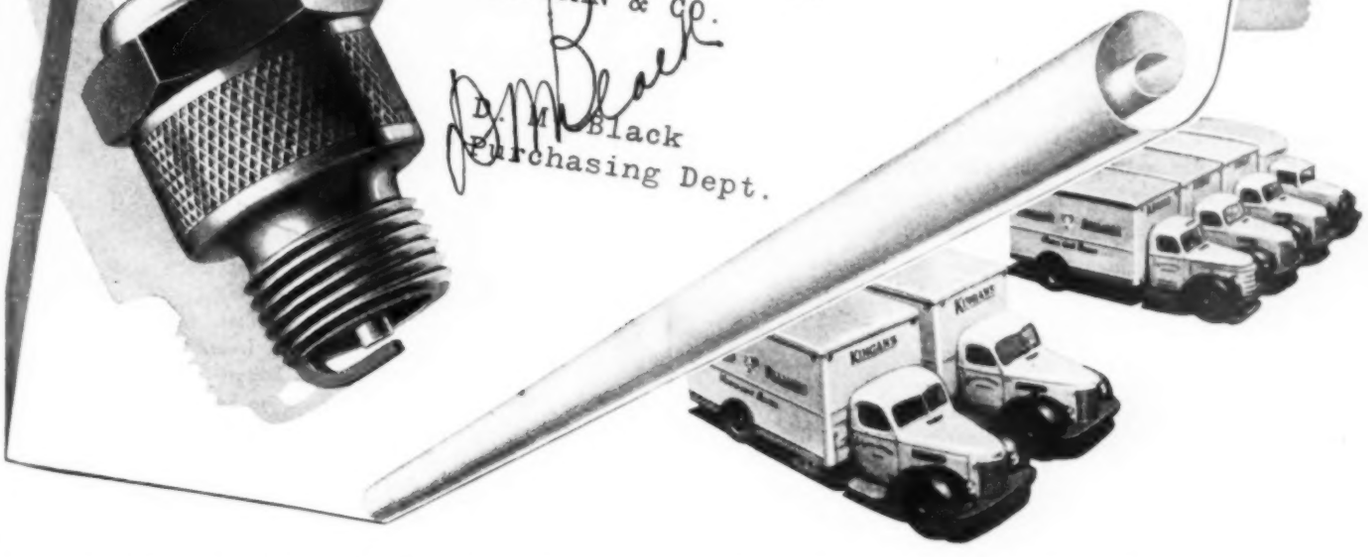
Gentlemen:

As users of Champion Spark Plugs we operate about 125 units in the distribution of "Kingan Reliable" Brand Meats and Dairy Products. In the hauling of perishable goods under refrigeration it is imperative that we maintain our delivery schedule as closely as possible and we can frankly say that we have gotten more dependable service from "Champions" than any other type plug used.

As a satisfied Champion user, we are

Yours very truly,
KINGAN & CO.

D. M. Black
Purchasing Dept.



Refrigeration trucks hauling perishable goods must, of necessity, maintain delivery schedules in order to avoid spoilage. That calls for dependable equipment and explains why the majority of successful fleet operators always specify Champion Spark Plugs. Years of experience and competitive tests have proved beyond a doubt the dependability and better performance ability of Champions. To "Keep 'Em Rolling Longer", install Champions in your fleet.

NO JOB TOO BIG—NO WORK TOO TOUGH—for CHAMPIONS

Trucks Washed ½ Hour Faster ... and Job Done 100% Better!

THIS is the experience of a fleet operator who was looking for a more effective truck-washing material. One that would do the work FASTER . . . loosen and remove road dirt, grime and grease THOROUGHLY . . . yet a material that would be SAFE to use on painted, lacquered or enameled surfaces.

Like many other leading fleet operators, he found the answer in that specially designed material . . .

OAKITE COMPOSITION No. 70

This operator discovered that not only was a HALF HOUR SAVED in washing each truck, but, as he tersely put it, "the job was 100% better." Oakite Composition No. 70 does not darken or change the original color of the finish. It rinses freely . . . does not streak . . . enables you to wash MORE TRUCKS in LESS TIME, at less cost.

Perhaps Oakite Composition No. 70 or other specialized Oakite truck-washing materials will provide comparable economies for you. Tests gladly arranged. Or ask us to send more details.

36-Page Booklet FREE!

This fact-filled booklet gives time-saving, money-saving data not only on washing buses and trucks, but also on such other essential maintenance work as degreasing repair parts, cleaning motors and chassis, reconditioning clogged radiators and cooling systems, keeping garage floors grease-free. Write for your FREE copy TODAY!

OAKITE PRODUCTS, INC., 52G Thames St., NEW YORK 6, N. Y.

Technical Service Representatives in All Principal Cities of the United States and Canada

OAKITE *Specialized* **CLEANING**

MATERIALS & METHODS FOR EVERY CLEANING REQUIREMENT

FLEET OWNER

(Automotive Fleet Headquarters)

Charter CCA Member

Published Monthly in the interests of Automotive Fleet Owners, who do all or part of their own Service, and devoted to the Better Operation and Maintenance of Truck, Trailer, Bus Passenger Car, Taxicab and all Automotive Fleets.

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ARMED FORCES COME FIRST
... Priorities are not required for Shaler products but the requirements of our Armed Forces or rated orders take much of our production, consequently the supply available for civilian needs is limited.

GIVE ENGINES EXTRA LIFE

CHASE GUMS AND SLUDGE WITH A KARBOUT AND RISLONE *"Tune-Up"*

● Trucks, buses, tractors and passenger cars represent an almost irreplaceable commodity. The War Effort requires that they develop "peak" performance at all times. Every possible mile of service must be procured from our existing supply of motor vehicles.

The KARBOUT-RISLONE "tune-up" will save you many man hours of labor on service and repairs—conserve critical materials required for replacement parts—reduce fuel and oil consumption and assure a quieter, smoother running engine.

A periodic KARBOUT "tune-up" through the intake manifold and the regular use of RISLONE in the crankcase will absorb power robbing gums that form on valve stems, in the guides, piston ring grooves and oil ring slots . . . all of which results in restoring lost power to the engine by freeing sticky valves and rings.

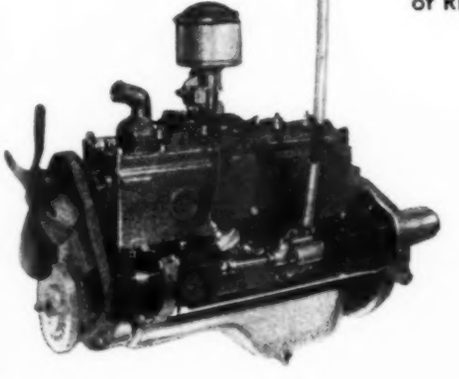
Shaler RISLONE and KARBOUT will *prolong engine life and lower operating costs.*

While Priorities are not required for KARBOUT and RISLONE, rated War Orders take a substantial portion of our production and the supply available for civilian needs is limited.

Place your orders well in advance of your needs with your regular Distributors. THE SHALER COMPANY, Waupun, Wisconsin, and Toronto, Ontario, Canada.

SHALER HOT PATCH TUBE REPAIRS VULCANIZED

Made by the makers of World Famous Shaler "Hot Patches" the safest tube repairs known.



SHALER

KARBOUT AND RISLONE

Write for Free copy of 64-Page Illustrated Book "Engine Performance"— a guide to lubrication and "Tune-Up" Procedure.

This Specially Engineered Structure of GATES is what gives you

Made of

Special Synthetic Rubber

OIL PROOF and Heat Resistant

A very special synthetic rubber is used. This special synthetic was not developed as merely a "substitute" for rubber. In truck and bus service, it is greatly superior to natural rubber.

30% Stronger Cords

The premium-grade cotton cord in the Gates specially engineered Black Truck Belt is fully 30% stronger than in the average passenger car belt.

Multiple-Ply Cover

A much thicker and stronger cover than used on the average passenger car belt is one of the chief reasons for the 50% to 80% longer life.

Specially Engineered *for TRUCK and BUS USE ONLY*

Look for the letter "T" on the belt label. "T" is for "Truck" and means that this Gates Black Truck Belt has been specially engineered for heavy duty truck and bus service.

WHY Sold for use on Trucks and Buses ONLY?

The Gates Black Truck Belt is sold for use on trucks and buses only. This is because some of the materials used are allocated for this particular purpose. Truck and bus transportation is important to the war effort. Gates Black "T" Belt must be used on trucks and buses only. Each belt container bears this statement.

Outlasts NATURAL Rubber 2 to 1 on Tough Rear-Engine Drives!

More than 5 years ago—long before Gates Black Truck Belts could be offered to Fleet Operators generally—Gates began supplying manufacturers of rear-engine coaches with thousands of belts annually made from this special synthetic rubber. Careful comparative tests were made and careful records kept. Without exception, these test records showed that belts of this special synthetic rubber gave more than twice the service given by any belt of natural rubber.

PROVED Through More Than 5 YEARS.

Remember, the special synthetic Gates uses in this belt is no new, experimental material. It has proved its great superiority in thousands of cases of the most grueling service a fan belt ever has to render.

"90% LONGER SERVICE"

SACRAMENTO, Calif.

"We installed your Series T Black Truck Belt when it was first placed on the market and it is giving approximately 90% longer service than even your pre-war belt."

Gibson Lines
W. T. Smith, Shop Supt.

"COST REDUCED 75%"

SAN PABLO, Calif.

"Our records show that since using your Black "T" series belt our belt replacements have been reduced approximately 75%."

R. A. Conyes,
David Allenby, Supt.

"70% LONGER LIFE"

LEXINGTON, Ky.

"We have increased the belt life about 70% with your Black "T" Belts."

Lexington Railway System

"BEST EVER USED"

SPRINGFIELD, Mo.

"For the past 16 months we have been using your Black "T" belt on all our units. It is the best truck belt we have ever used."

Mo.-Ark Trailways
D. W. Steele,
Supt. of Maintenance

BLACK Truck Belt
50% to 80% Longer Wear!

And, In Addition—

The *Special* Synthetic Rubber used Wears *TWICE* as *LONG* as even *NATURAL* Rubber Where Oil or Heat Is Present!

Hundreds of the largest and most efficient fleet operators in the United States have now taken the trouble to write letters saying that the Gates Black Truck Belt is giving them 50% to 80% longer wear than any other belt they ever used. Some of these letters are reprinted here. They are convincing evidence that the specially engineered construction of the Gates Black Truck Belt—shown in detail on the preceding page—will save *you* fully 50% to 80% in belt costs and in the even more expensive delays for servicing your units.

In addition, if you happen to operate rear-engine buses in which constant acceleration and deceleration create great heat—or other units in which the impossibility of thorough servicing during these rush days has created a bad oil condition—you will be interested in a still further saving due to the special synthetic rubber used in making Gates Black Truck Belts. This special synthetic rubber, by actual tests on hundreds of big city buses, gives more than *twice* the *wear* of any *natural* rubber belt ever used.

Not only in the structure of the belt, therefore, but also in the special synthetic rubber and other materials used, the Gates Black Truck Belt is specially engineered to meet every single requirement of truck and bus service. Isn't it natural that a belt built especially to fit truck and bus conditions will do a much better job in truck and bus service?

You Wouldn't
Use a Passenger Car *TIRE* on your Truck!
WHY use a Passenger Car BELT?

The difference between the requirements of a truck and a passenger car is just as important in the case of *belts* as in the case of *tires*. That is why the big fleet operators who use the Gates Black Truck Belt are getting 50% to 80% longer wear—and the even bigger savings that go with fewer belt changes and less idle servicing-time for all their units.

Read their letters here reproduced—note the names, the high standing and the *practical experience* of the men who testify to these important savings. Surely you must conclude that it is well worth while to call your jobber right now and tell him you want Gates Black Truck Belts.

GATES Jobbers NOW Have Stocks of GATES Series "T" BLACK Truck Belts.

THE GATES RUBBER COMPANY
DENVER, U. S. A.
World's Largest Makers of V-Belts

CHICAGO, Ill.

"Gates "T" series of Black Belts are giving many more miles of service and we have never had to make a road service call due to belt failure."

Decatur Cartage Co.
A. A. Russ, Garage Supt.

"LESS TIME OUT For SERVICING"

GENEVA, N. Y.

"Gates T-series Black Truck Belt gives us many more miles of service with much less time out for servicing."

The Market Basket Corp.

OKLAHOMA CITY, Okla.

"Our belt cost per mile is much lower due to these specially engineered Black "T" Belts for heavy duty truck and bus service."

"Much Lower Costs"

Oklahoma Trans. Co.
H. H. Rush, Purchasing Agent

"75% LONGER LIFE"

NASHVILLE, Tenn.

"Your Black "T" series Truck Belt is superior to pre-war belts, giving about 75% longer wear than any other belt we have ever used."

Wilson Truck Co., Inc.
E. T. Overman, Mgr.

"80% LONGER LIFE"

OMAHA, Nebr.

"The Gates Black "T" belt gives us 80% longer life than its pre-war brother. We vote this Black "T" belt the best ever made."

Watson Bros. Trans. Co.
C. M. Manson, Shop Foreman

HEIN-WERNER
HYDRAULIC JACKS
are super-powerful and easy-operating

HERE'S WHY H-W HYDRAULIC JACKS *are easier to operate*

In a split-second, mere finger pressure is transformed into a lifting force of several tons

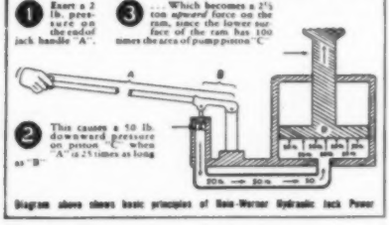

1 Exert a 2 lb. pressure on the end of jack handle "A".
3 ... Which becomes a 2½ ton *upward* force on the ram, since the lower surface of the ram has 100 times the area of pump piston "C".
A
B
2 This causes a 50 lb. downward pressure on piston "C" when "A" is 25 times as long as "B"
C
20 ton
50 ton
30

Diagram above shows basic principles of Hein-Werner Hydraulic Jack Power

(Model 20.10A)

H-W Jacks are made in models of 3, 5, 8, 12, 20 and 30 tons capacity

Ask your H-W Jobber for details--or write us

HEIN-WERNER MOTOR PARTS CORP., WAUKESHA, WISCONSIN

... then what?
Someday, telegraph and telephone will tell the manufacturers of tanks, jeeps and army trucks that war production is through.
"then what?" That is an overtime question today in plants jammed with war work. But it is getting serious consideration. Manufacturers know that the change from war to peace economy will call quickly for motor trucks and buses.
One thing you can count on—more equipment offered you will list TRU-STOP Emergency BRAKES as standard or optional. Because the experience of army units with these rugged, ventilated disc brakes has proved that they have such unique ability to give repeated smooth, safe stops from any vehicle speed—and that they cut brake maintenance to the bone.
If your local source of trucks and buses cannot give you advance information on why your new equipment would operate more safely and economically by installing TRU-STOP Emergency BRAKES, write us direct.
TRU-STOP Emergency BRAKES
AUTOMOTIVE AND AIRCRAFT DIVISION
6-235 General Motors Building, Detroit • 695 Bryant Street, San Francisco
In Business for Your Safety
ACCO
AMERICAN CHAIN & CABLE COMPANY, Inc.
BRIDGEPORT • CONNECTICUT

DOES NOT GROW DIM

2 FIXED FOCUS FILAMENTS ACCURATELY LOCATED
PRECISION LENS
ONE-PIECE "ALL GLASS" UNIT... NO DIRT OR MOISTURE CAN SEEP IN. THE WHOLE THING IS A G-E MAZDA LAMP
MIRROR-LIKE REFLECTING SURFACE OF VAPORIZED ALUMINUM

THE WHOLE THING IS A BULB!

YES, the G-E Mazda "All-Glass" Sealed Beam Headlamp *does not grow dim,* because:

1. The whole thing is a rugged, hermetically sealed bulb, which air, dirt and moisture cannot penetrate.

2. The reflector never tarnishes.

3. Filament, lens and reflector are one sealed unit, so that road vibration cannot shake parts out of adjustment and reduce effective light.

That's why the G-E Mazda "All-Glass" Sealed Beam headlamp maintains its initial brightness right up to the end of its life. *It does not grow dim.*

G-E MAZDA LAMPS

GENERAL ELECTRIC

Hear the General Electric radio programs: "The G-E All-Girl Orchestra," Sunday, 10 p. m., EWT, NBC; "The World Today," news every weekday, 6:45 p. m., EWT, CBS.

BUY AN EXTRA WAR BOND NOW!

Facts and Flashes

From the
ETHYL CORPORATION
Chrysler Building, N.Y.C.

Things are getting so tough for truck operators these days that many a hard-pressed maintenance man wonders if life wouldn't be sweeter if he were drafted. Just think, no more scurrying around for parts, no more sessions with government agencies, no more wartime parts of inferior quality, no more trying to keep trucks on the road that should have been retired about a million miles ago.

However, since trucking is essential and he's probably over-age anyhow, our truck operator will go right on "keeping 'em rolling" in spite of his day dreams.

We wonder, though, how many men in motor transportation realize that, along with the gray hairs they're getting, they're also receiving quite an education. Any operator who can successfully keep his fleet in operation now will be in a position to do a better peacetime job than he ever thought possible. He'll know how to get more out of equipment, parts, manpower, gasoline and lubricants. He'll have discovered dozens of short-cuts in making repairs—how to conserve on such things as anti-freeze and tires—the importance of preventive maintenance—and all kinds of new tricks.

Yes, sir—any man who goes through this battle of transportation will really have something extra to offer when the war's over—a training in the school of hard knocks that cannot be duplicated.

* * * *

Opinions vary as to best ways to offset knock caused by lower octane gasolines. Richer carburetor settings, changes in timing, extra cylinder head gaskets, all have been experimented with by various operators—but, remember, specific changes must be based on individual situations, taking into consideration type of service, make of engine, and age of equipment.

* * * *

According to one well-informed source, if all post-war excess aviation gasoline over actual post-war requirements were dumped into motor gasoline "pool," it would result in a rise of only two to three octane numbers above pre-war levels.

* * * *

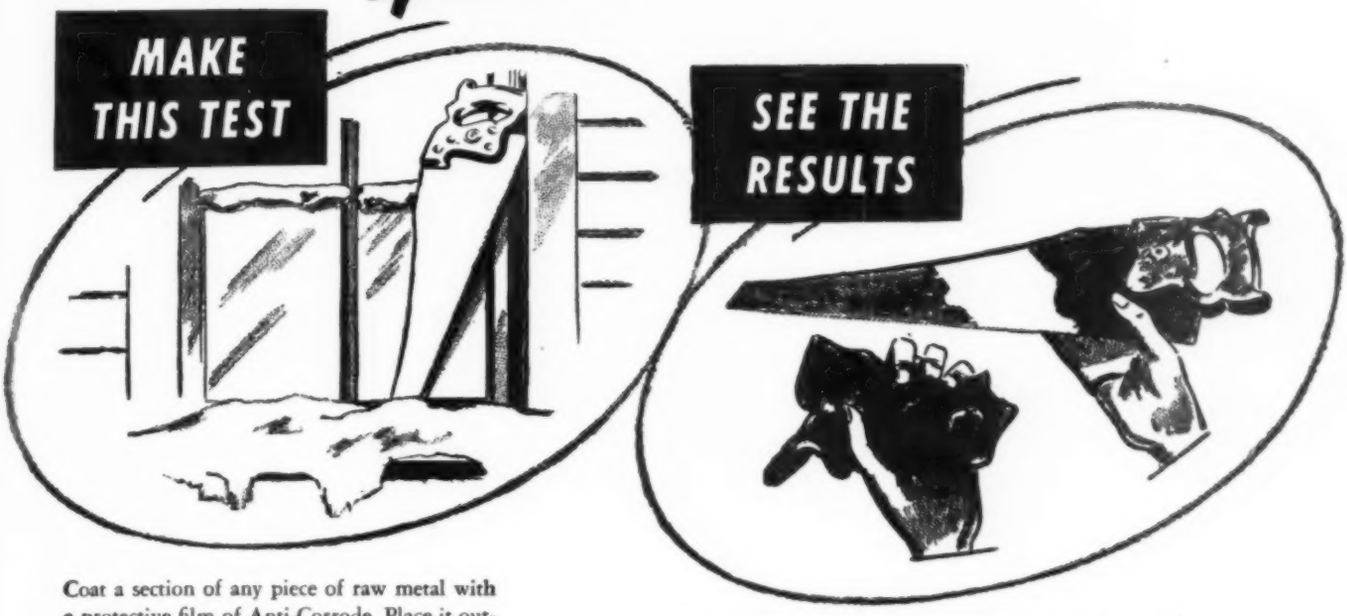
Every American soldier overseas requires an average of more than 50 gallons of petroleum products per week. OIL IS AMMUNITION — USE IT WISELY.

Late Flash

Gasoline manufactured under government regulations limiting antiknock value of civilian gasolines to a maximum of 72 for regular and 76 for premium has now reached retail outlets. Quick check of samples from service stations shows an average of less than one-half an octane number above 72 for regular and almost exactly 76 for premium.

DAYTON WHEELS
STRETCH PAYLOADS TWO WAYS!
RIGHT now, Dayton Spoke Type Cast Steel Wheels can help you move more payload with your present rolling stock. And with today's terrific demands on a Trucking and Bus Industry faced with a growing equipment shortage, that's an important item.
Stretch your payload like this:
1. By cutting deadweight. Although stronger, they weigh less; and because of the Dayton demountable rim wheels, even the weight of extra wheels is eliminated.
2. By protecting running time. Dayton demountable rims save time on tire changes. This protects schedules with quick roadside changes; cuts maintenance time when switching and rotating tires.
In addition, Dayton Wheels conserve tire wear with a fanning action of the spokes that air-cools tires and brake lining. Positive elimination of rim slippage and subsequent uneven wear adds up to more of the same. Specify Dayton Wheels on your new equipment . . . or for all replacements.
★ ★ ★
The Dayton Steel Foundry Co.,
Dayton, Ohio
DAYTON BRAKE DRUMS — Drums assembled to the wheels at the factory give more perfect concentricity.
DAYTON FIFTH WHEELS — Standard equipment on many trailers. Provide quick coupling. Positive operation.
DAYTON LANDING GEARS — Hydraulic and mechanical.
Dayton
SPOKE TYPE CAST STEEL WHEELS
Dayton Wheels are available on any of the following: Trucks — Autocar, Federal, International-Harvester, Gramm, Mack, Studebaker and White. Trailers—Fruehauf, Trailmobile, Gramm, Kingham, Edwards and Mono. Buses — Brill, Mack, and Pullman. Specify Dayton Wheels, Brake Drums, Fifth Wheels and Landing Gears for your own trucks, trailers, buses.
★ BUY WAR BONDS AND STAMPS ★

How to *prevent* Corrosion



Coat a section of any piece of raw metal with a protective film of Anti-Corrode. Place it out-of-doors, and leave exposed to the elements.

Rain, snow, changing temperature, dust and grime have eaten into and oxidized the unprotected metal. But note surface under Anti-Corrode film—bright and unharmed, in its original state.

CITIES SERVICE ANTI-CORRODE is a safe rust and corrosion preventive that brings amazing results. It is a reliable safeguard against corrosion of metals in any form or state of finish—whether in storage or in transit. Anti-Corrode forms a tenacious, durable film that is impervious to moisture and the more common gases prevalent in the atmosphere. And, since it contains lubricating material, it need not be removed in drawing operations. Anti-Corrode is made in several grades to meet specific requirements and severest tests. It is economical, easy to apply and can be removed with kerosene or any petroleum solvent.

This TEAM Will Save You Money and Materials

Recently, we announced the development of Cities Service Rust Remover, and responses to the demonstration offer far exceeded our expectations. Rust Remover, of course, *removes* rust. Anti-Corrode is designed to *prevent* rust and corrosion. Together, they will safeguard your equipment and war production—for the duration!

Take advantage of this FREE ANTI-CORRODE demonstration offer
Mail this coupon today!

(Available only in Cities Service marketing territory EAST of the Rockies.)

CITIES SERVICE OIL COMPANY
NEW YORK · CHICAGO

ARKANSAS FUEL OIL COMPANY
SHREVEPORT, LA.

CITIES SERVICE OIL COMPANY
Room 128, Sixty Wall Tower, New York 5, New York

Gentlemen: I would like to test Anti-Corrode on my own equipment FREE OF CHARGE. Please send me the details.

Name_____

Company_____

Address_____

City_____ State_____

SIX MONTHS' TEST PROVES
Boots Nuts Eliminate Periodic Tightening

UNITED PARCEL SERVICE

33rd E 30th STREET
NEW YORK

November 15, 1943

Boots Aircraft Nut Corporation
New Canaan
Connecticut

Gentlemen:

The sample Boots Stop Nuts which you supplied have now been in use on several of our vehicles, both light and heavy, for a period of six months.

We selected two difficult spots for their application, drive shaft universal joint flanges and chassis spring U-bolts. At these points plain nuts are not satisfactory unless a lock washer or jamb nut is used to hold them. Even so, they require periodic tightening.

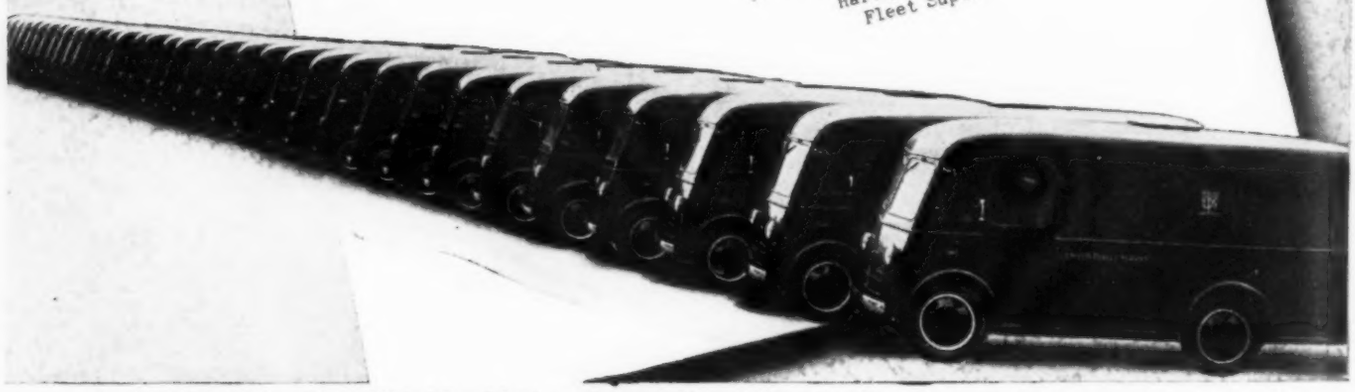
The Boots nuts in use have not required any attention since they were installed.

Very truly yours,

UNITED PARCEL SERVICE

Harvey H. Earl

Harvey H. Earl,
Fleet Supt.



A portion of the 2900-truck fleet of United Parcel Service trucks serving 16 metropolitan cities. Boots Nuts were tested on trucks like these.

This report of a test made by the country's outstanding consolidated delivery company, operating in sixteen cities, is a clear-cut indication of the economies that Boots All-Metal, Self-Locking Nuts will effect in the transportation field after victory.

Boots Nuts will cut maintenance costs on buses and trucks by eliminating periodic tightening check-ups on: spring clips; body bolts; bumpers; clutch pedals; universal joints; brakes; axle supports; wheel nuts—wherever vibration loosens ordinary fastenings.

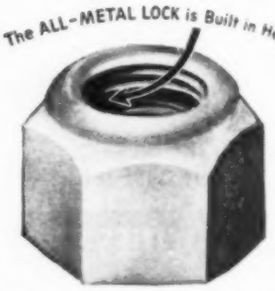
One piece, all-metal, Boots withstand the corrosive action of oil, water and chemicals. There's nothing to dry out, crack or shrink. Also, Boots Self-Locking Nuts can be used over and over without accelerated locking loss.

BOOTS SELF-LOCKING NUTS

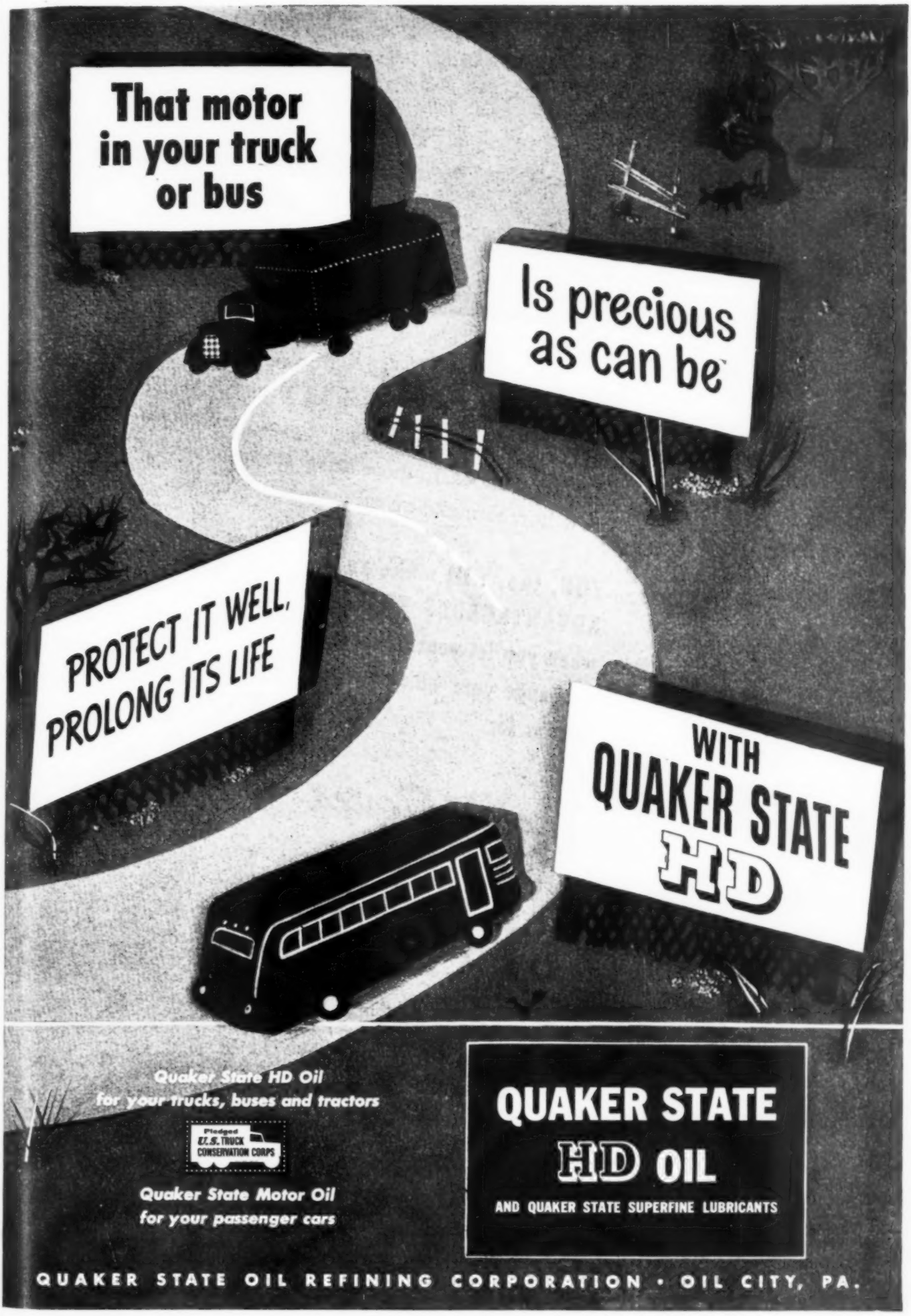
"There's No Excuse for a Nut Shaking Loose"

Boots Aircraft Nut Corporation • General Offices, New Canaan, Conn.

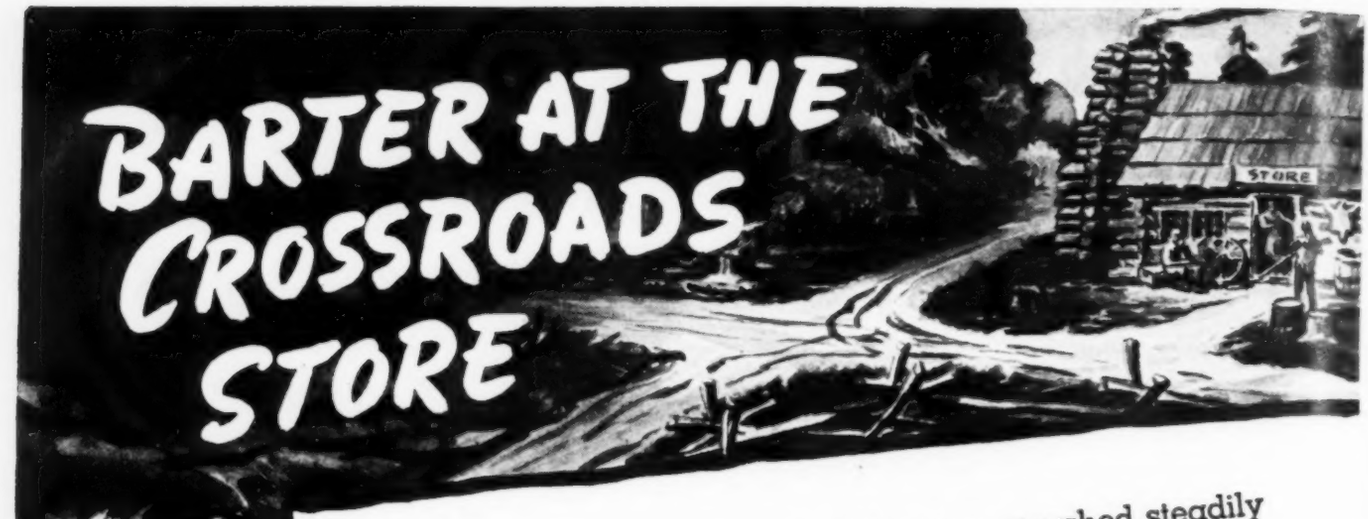
The ALL-METAL LOCK is Built in Here



ROL-TOP. This style nut, now used on all types of aircraft engines, is the type of Boots All-Metal, Self-Locking Nut mentioned in the above letter.


That motor in your truck or bus
Is precious as can be
PROTECT IT WELL, PROLONG ITS LIFE
WITH QUAKER STATE HD
Quaker State HD Oil for your trucks, buses and tractors
Pledged U.S. TRUCK CONSERVATION CORPS
Quaker State Motor Oil for your passenger cars
QUAKER STATE HD OIL
AND QUAKER STATE SUPERFINE LUBRICANTS
QUAKER STATE OIL REFINING CORPORATION • OIL CITY, PA.

BARTER AT THE CROSSROADS STORE



In the days when America's frontiers marched steadily westward, the pioneers traded their pelts, cordwood and corn at the cross-roads store for gunpowder, cotton goods and shoes. In those adventurous days every man knew how to make an advantageous trade.

YOU, too, will make an ADVANTAGEOUS TRADE when you let your jobber exchange your ailing fuel pumps for

Factory Tested

AIRTEX

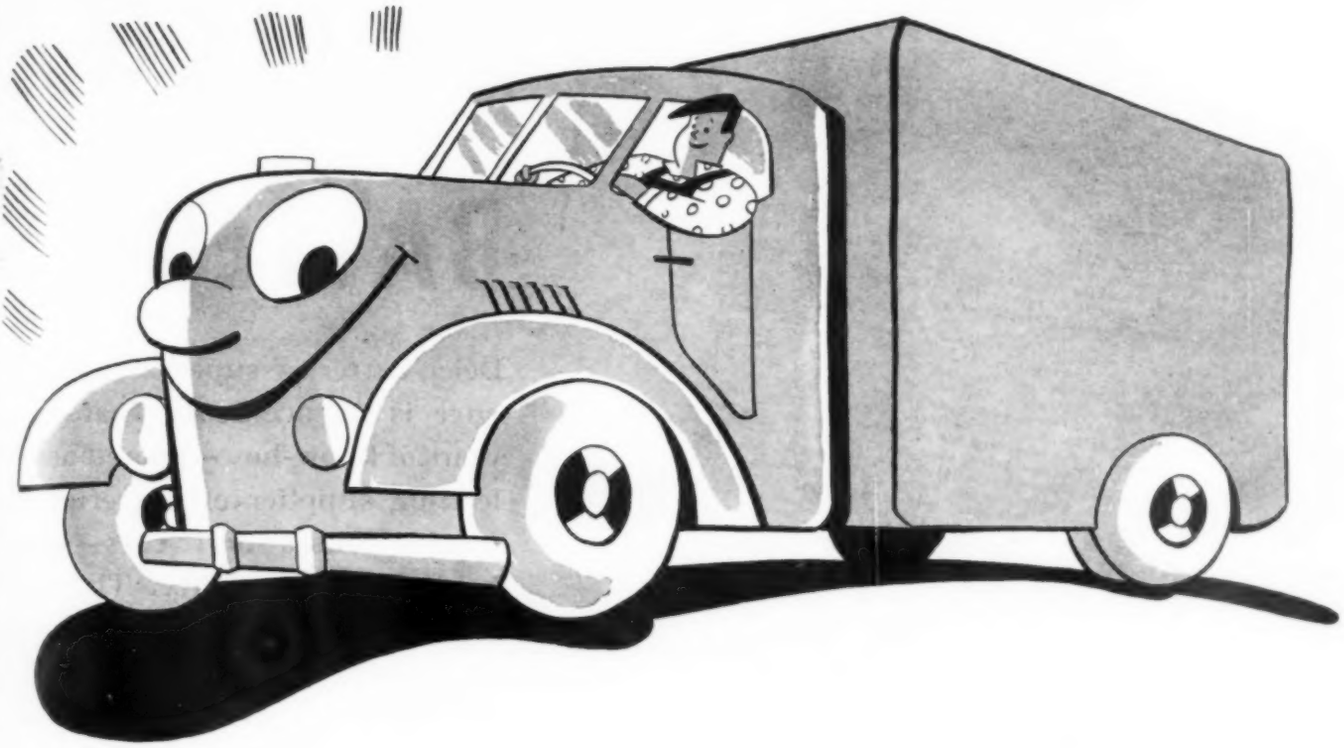
Exchange

FUEL PUMPS

assembled with AIRTEX Diaphragms Guaranteed for 50,000 MILES

AIRTEX AUTOMOTIVE CORPORATION, FAIRFIELD, ILL.

It won't be long now!

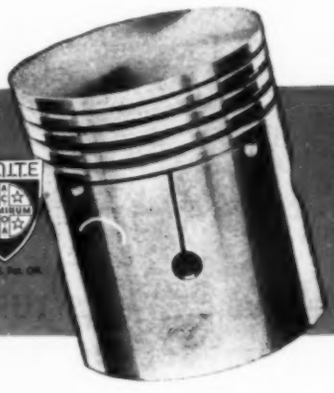


You can credit that smile to the prospect of a real overhaul job for an engine which long ago passed the "please restore my youthful pep" stage. Of course that will include new Lynite* LO-EX Pistons.

When the repair shops can take care of the thousands of cars needing this kind of service, depends on how the war progresses. It's largely a question of man power.

Remember that Lynite LO-EX. Pistons provide superior performance, longer engine life and added economy. They have low coefficient of expansion, give maximum heat flow, permit close clearances. Oil and gas consumption and carbon formation are held to a minimum. ALUMINUM COMPANY OF AMERICA, 2161 Gulf Building, Pittsburgh, Pennsylvania.

*Lynite and LO-EX are registered trademarks of Aluminum Company of America.



LYNITE LO-EX PISTONS . . A PRODUCT OF

ALCOA ALUMINUM

"the most economical we have ever used"

Cleveland - Pittsburgh Freight Line, Inc.

C P

PITTSBURGH TERMINAL
23rd and Smallman Streets
ATlantic 9510

3515 LAKESIDE AVENUE • CLEVELAND, OHIO

HEnderson 6919

June 5, 1943

L. L. Drown,
United Motors Service Inc.,
3044 West Grand Blvd.,
Detroit, Michigan

Dear Mr. Drown:

During this busy period, most people don't ordinarily take time out to write a letter of this nature, but in the past we have had so much time out with our fleet that we thought it would be well for us to relate to you the experience we have had in overcoming some of these, "time's out."

Prior to August 20, 1942, the winter months always created a great deal of interruptions, time out, and delays to our fleet due to battery trouble. At that time we were using several different makes so, decided, before the oncoming cold weather to prepare our trucks far in advance to see if we couldn't ward off some of these delays and interruptions. After a thorough inspection we found that it was necessary for us to purchase four new batteries and accordingly four new Delcos were installed August 25, 1942 and as others needed replacement we also installed new Delcos. I am pleased to state that during the entire following winter months of 1942 and 1943 the batteries that were installed were the most economical that we had ever used and at the present time we haven't had a failure within 60,000 miles or more. This, of course, is going to make us a constant user of Delco Batteries, the most economical battery we have ever used in our fleet.

Very truly yours,

CLEVELAND - PITTSBURGH FREIGHT LINE

John J. Drop

John J. Drop
President

writes a fleet user of

DELCO HEAVY-DUTY BATTERIES

Delco batteries' superior performance is no accident. Years and years of know-how—gained as the leading supplier of batteries for trucks, buses and cars—stand behind Delco quality. They are rugged and reliable—built tough for tough service. Regardless of the size or type of your fleet, you'll make a wise choice by equipping all your vehicles with Delco heavy-duty batteries. There is a size and type for every need, including special Diesel-type Delco batteries for extra-heavy Diesel cranking.

Let's All Back the Attack!

BUY WAR BONDS

WRITE FOR FREE BOOKLET

UNITED MOTORS SERVICE
GENERAL MOTORS BUILDING
DETROIT 2, MICHIGAN

Please send to the address below, a copy of "Delco for the Long Haul," containing Delco battery applications for all makes and types of equipment.

Name _____

Firm _____

City _____ State _____

UNITED SERVICE MOTORS

Delco heavy-duty batteries for trucks, buses and other commercial vehicles are sold through independent distributors and United Motors Service branches located in all parts of the country.

Delco-Remy
DIVISION, GENERAL MOTORS CORPORATION

WHEREVER WHEELS TURN
OR PROPELLERS SPIN

War-Proven and Here to Stay—
THE RECAPPER

He Helped Save the Nation After Pearl Harbor And Proved His Economic Value In Tire Conservation For All Time To Come.

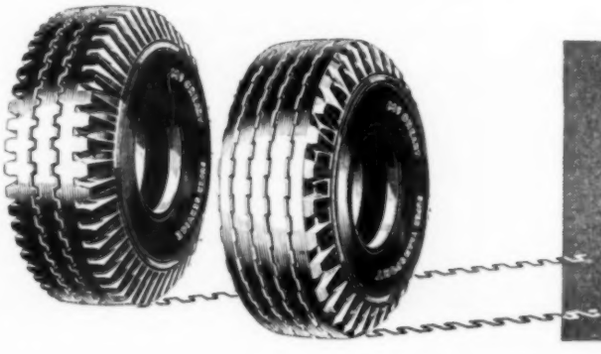
AMERICA owes the recapper a debt of gratitude. His was the vitally important job of defending the nation's stockpile of crude rubber until synthetic production could be established in sufficient volume to take care of the country's needs.

The famous Baruch Report clearly pointed out that we could lose the war if our rubber-borne transportation failed. Yes—it took Pearl Harbor to shock the nation into a realization of the importance of rubber conservation.

Close students of highway transportation realized years before Pearl Harbor that recapping will always offer the best means of obtaining most miles per dollar in tire use. For years, McCREARY TIRES have been designed and built with the recapper's requirements in mind. The aim of the McCREARY company has been to build a tire with more original miles—more recaps from each casing—more miles on every recap.

McCREARY TIRE & RUBBER COMPANY • INDIANA, PENNA.

It is no accident that such a large percentage of McCREARY TIRES are distributed through the recappers. This is our pledge: *In the years to come, with new materials and new conditions, McCREARY TIRES will always be built with the requirements of the recapper among the top considerations.*



McCREARY
"Built for Longer Service"
TIRES

A mud-spattered windshield. In the glare of oncoming headlights, the driver missed his turn — and an irreplaceable truck is lost to the war effort.

The importance of frequent safety check-up at major points need not be stressed to fleet operators. Here are some other less obvious safety points, often overlooked . . . .

Be sure fire extinguishers are in good working order and properly located for instant use. Replace cracked or discolored windows and windshields. Be sure directional signals are working properly. Don't set up schedules which call for excessive speeds. Impress on operators the danger of high speeds under today's conditions. If necessary, install governors (available on proper priorities). Don't neglect faulty windshield wipers. Above all, enlist the cooperation of drivers. If they understand the extra wartime importance of observing safety rules, they will be more careful in observing them.

● Our war job is to turn out heavy wreckers and military fire equipment. This assignment requires our all-out effort from a production standpoint. However, our engineers will be glad to work with you now in the development of fire equipment or commercial trucks engineered to your postwar needs.

WARD LaFRANCE

TRUCK DIVISION

ELMIRA • GAI GREAT AMERICAN INDUSTRIES • NEW YORK

© 1944 G. A. I., Inc., Meriden, Conn.

HEAVY COMBAT VEHICLES USE--

WAGNER AIR CONTROLS

Army's M-5, 13-ton high-speed tractor pulling a 155-mm howitzer. This prime mover is equipped with Wagner air controls.

Wagner can furnish air-brake systems that will give outstanding economy, not only in brake maintenance, but also in increased safety. A national organization stands ready to offer any service that is necessary in the field. Write for Bulletin KU-50.

THE SUCCESS AND SAFETY of our armed forces depends upon the reliability of the equipment used. Combat vehicles in this war are built to take a lot of punishment, and they have proved that they can "take it."

Many of the heavy-duty military vehicles and prime movers used by the armed forces are equipped with Wagner air controls. These controls, which are parts of the Wagner Air-Brake Systems, are also utilized on many other types of combat vehicles to supply compressed air for steering, gear-shifting, and tire inflation.

K44-2

ARMY E NAVY

Wagner Electric Corporation
ESTABLISHED 1891
6480 Plymouth Avenue, St. Louis 14, Mo., U.S.A.
AUTOMOTIVE AND ELECTRICAL PRODUCTS

WAGNER *Air Brakes*

They found that every haul has a s

The Joplin Transfer and Storage Co. has worked out a direct route to lower maintenance costs

WITH their hustling fleet of trucks averaging 125,000 miles yearly, the Joplin Transfer and Storage Co., of Joplin, Mo., still manages to bat 1000 in truck conservation and low cost maintenance.

There are just two things they do, according to Mr. Frank B. Shunk, the Secretary-Manager, in keeping their fleet at constant peak efficiency:

1. They have a maintenance program in their garage, supervised by a capable service manager.

2. *They use Veedol oils and greases exclusively.* (They also are 100% users of Tydol *Flying "A"* gasoline.)

This is a fine system at any time. But today, under severe war conditions, it's an AA1 *necessity.* For not only do low operating costs figure in, but the protection of irreplaceable equipment as well.

If you have equipment to keep at top efficiency for a long, hard-working life, we have what it takes to do it. MORE than the tough, wear-fighting Veedol oils and greases . . . a proven maintenance plan as well!

Here's a blueprint for making YOUR equipment last!

Co-operating in the O.D.T. program, the engineers of Tide Water Associated have perfected a Preventive Maintenance Plan for trucks and buses. It took months to work out, but it's a sure-fire way of getting more miles, better miles, and cheaper miles out of your rolling equipment.

Many very large fleet owners already have given the Veedol Preventive Maintenance Plan a hearty O K. But *any* size fleet can use it profitably. For

Now available to commercial users —
THE VEEDOL 90 SERIES OILS

Tide Water Associated has now expanded its production of Veedol 90 Series Oils to the point where a limited volume of these oils may be used for civilian commercial activities, where engines, both gasoline and Diesel, are required to perform under *Heavy Duty* operating conditions. These oils are now available in S. A. E. grades 10, 20, 30, 40 and 50.

The Veedol 90 Series Oils are *100% Pennsylvania Oils*, containing additives which impart high dispersive properties as well as anti-oxidation properties to the oil. The nature of the oil, together with the above mentioned properties, tends toward:—

1 The prevention of products of combustion (soot, gummy materials), and finely divided dirt particles from coalescing, forming heavier deposits which settle out in the engine, tending to stick rings, plug oil leads, gum valve stems, etc.

2 An oil more resistant to oxidation by the catalytic effect of the metal which the oil comes in contact with, thus decreasing the formation of harmful organic acids corrosive to the newer alloy bearings.

3 The holding in suspension of finely divided carbon, soot, dirt, etc., not permitting them to build up into harmful deposits (sludges). These suspended materials are *drained out* with each oil change, resulting in an engine which is almost factory clean.

4 Easier starting and more rapid distribution of oil throughout the engine under cold starting conditions.

5 Lower oil consumption in an engine under all operating conditions.

Remember, the Veedol 90 Series Oils are made from the finest of 100% Pennsylvania crudes, and retain all the natural advantages which oils made from these crudes possess.

s a short-cut . . . in costs!

he Plan is tailored to fit *your exact* umber of units.

The cost? The Plan itself costs you othing. A Veedol representative will eliver it, and go over it with you, ithout charge. The necessary forms ill be supplied you at cost—only 18¢ er truck or bus, with a one dollar inimum.

et a staff of engineers—for NOTHING!

Here's something else! If you have an nusual maintenance problem that as baffled you, write the Engineer Consultant Staff, Tide Water Associated. This group will study the details you give, analyze them, and make suggestions for the cure—free, gratis, for nothing!

Time's a-wasting! Your copy of the Veedol Preventive Maintenance Plan is ready for you. Drop us a line and tell us to have a Veedol representative call and go over it with you. And—better do it *today*.

TIDE WATER ASSOCIATED OIL COMPANY

New York
17 Battery Place

Tulsa
Thompson Bldg.

VEEDOL

OILS AND GREASES

OIL IS AMMUNITION — USE IT WISELY

VEEDOL
MOTOR OIL

BUY MORE WAR BONDS

How to ruin a trailer in no time at all!

LOAD IT with more weight than it was designed to carry.

HIGHBALL IT over a jungle trail. Or frozen Arctic tundra. Or slam it over shell-pocked roads strewn with land mines.

BAM! Along comes a near-hit by an enemy bomb. It hurls the trailer 20 feet. Presto! One ruined trailer.

That's what happens to thousands upon thousands of trailers in this war. That's why such military equipment must be replaced at a fantastic rate.

And that's why Motor Transport at home hasn't gotten the trucks and trailers it needs. But even so, it has done a magnificent job with too few trucks, trailers, tires and men.

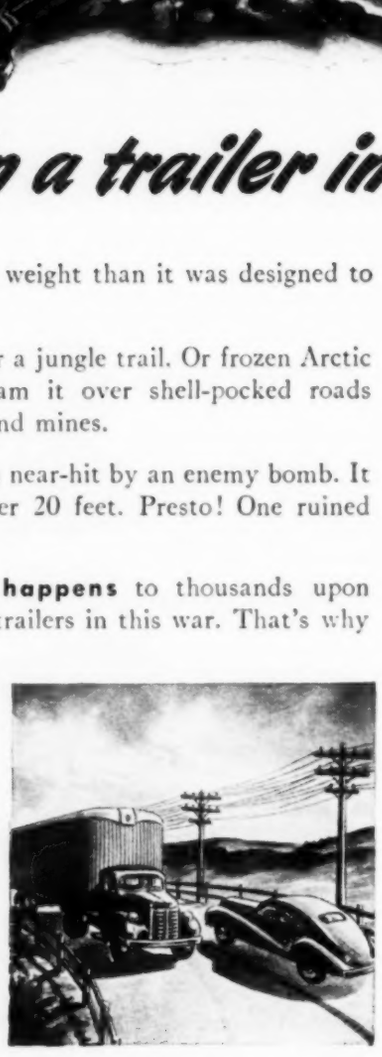
GOOD NEWS FOR YOU

Trailmobile is making trailers again for civilian uses!

Recent government allocations permit us to make several thousand commercial trailers during 1944. We will make our entire allotment without any let-up in our production of vital equipment for the Armed Forces.

Our one aim is to serve the needs of Motor Transport—on the fighting fronts and on the highways of America.

See your nearest Trailmobile distributor or branch right away. Or write us.



If you need Trailer Service

. . . Trailmobile operates service centers at strategic points. Let us help you keep your old equipment rolling until you get new units. Write for the locations of the Trailmobile Service Centers near you.

ARMY (E) NAVY

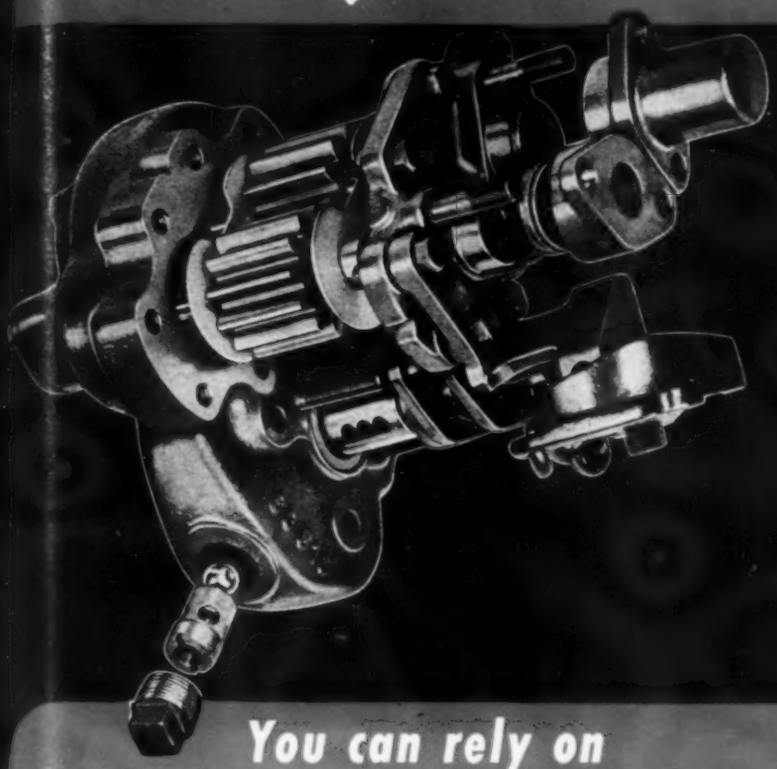
TRAILMOBILE

The Trailer Company of America

Cincinnati 9, Ohio **Berkeley 2, Calif.**

Commercial Trailers for War and Peace • The Vital Link in Flexible Transportation

"The Pump is the Heart of the Hoist"



...and this Heil-designed pump is one big reason for Heil dependability

The product of years of engineering research and manufacturing experience, this Heil hydraulic pump is proving itself again on all the battlefronts of the world — as it had already proved itself on commercial truck equipment.

You can rely on Heil Hydraulic Dump Units

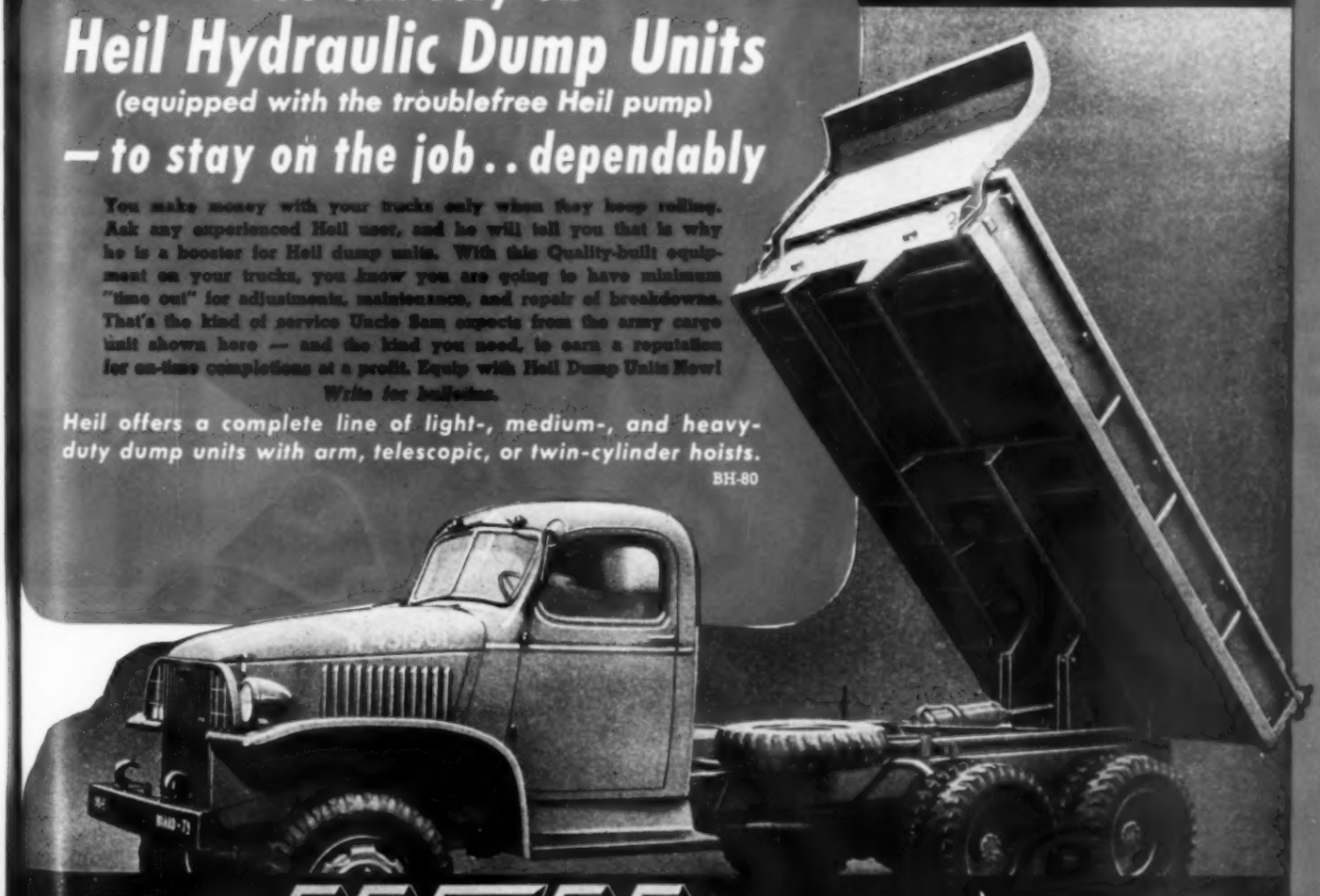
(equipped with the troublefree Heil pump)

— to stay on the job .. dependably

You make money with your trucks only when they keep rolling. Ask any experienced Heil user, and he will tell you that is why he is a booster for Heil dump units. With this Quality-built equipment on your trucks, you know you are going to have minimum "time out" for adjustments, maintenance, and repair of breakdowns. That's the kind of service Uncle Sam expects from the army cargo unit shown here — and the kind you need, to earn a reputation for on-time completions at a profit. Equip with Heil Dump Units Now! *Write for bulletins.*

Heil offers a complete line of light-, medium-, and heavy-duty dump units with arm, telescopic, or twin-cylinder hoists.

BH-80



THE HEIL CO.

ARMY E NAVY

GENERAL OFFICES • MILWAUKEE 1, WISCONSIN

Permanent
QUALITY
Equipment

...Not Just INTERIM JACKS

★ These aren't "for-the-duration" jacks. There is no substitute quality in them.

Rather, they are the finest portable hydraulic jacks that Walker has ever made, proven in grueling usage by our armed forces everywhere, and by expanded demands on the home front.

In them have been incorporated all the refinements and rugged dependability learned in years of manufacturing and field experience.

Walker is building more of these jacks than ever before, and the benefit of the improved production experience is reflected in their increased quality and stamina.

The standards which have made Walker the world's leading builder of automotive lifting equipment are being maintained and improved today—as always. You can count on uncompromising Walker quality in every jack you buy—now and in the future. It's the reason Walker leads in jacks.

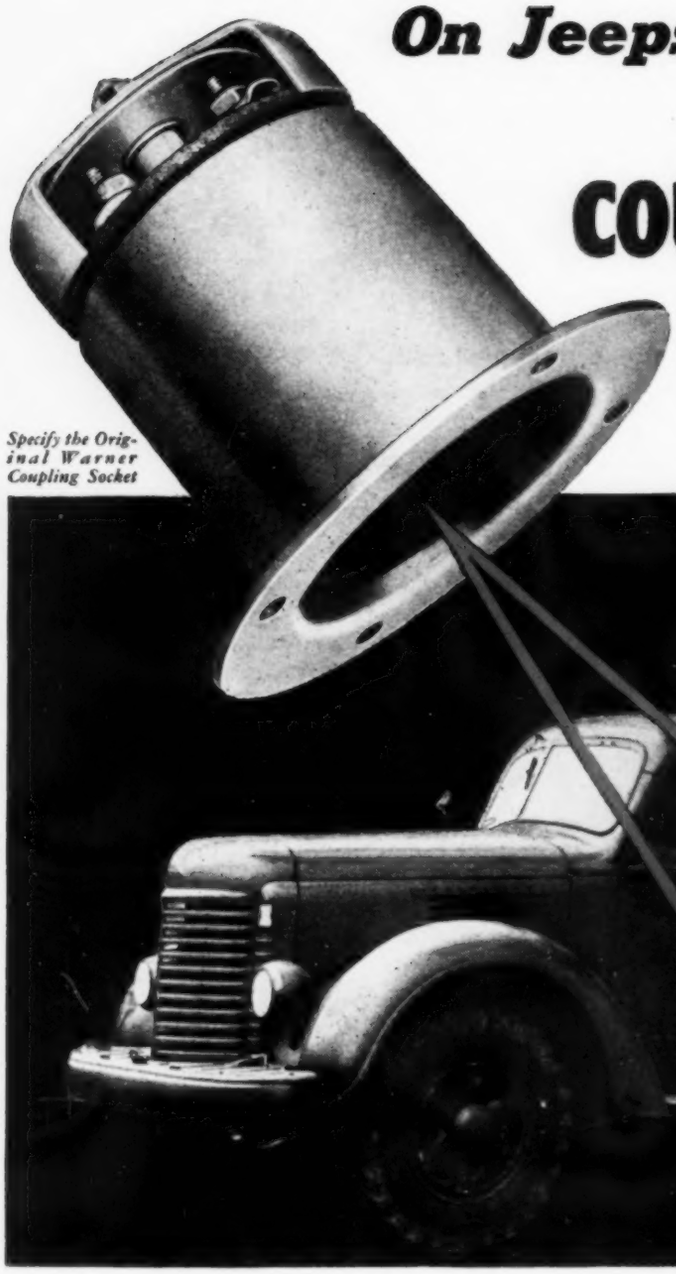
WALKER MANUFACTURING COMPANY OF WISCONSIN
Racine, Wisconsin
Also Makers of Walker Silencers and Electric Lifts

The Famous Walker
"900" SERIES

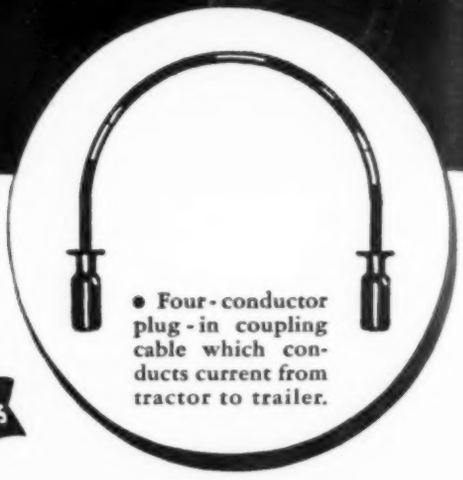
WALKER *leads in* JACKS

On Jeeps or Largest Trucks

WARNER COUPLING SOCKETS GIVE Unmatched Service



Specify the Original Warner Coupling Socket



• Four-conductor plug-in coupling cable which conducts current from tractor to trailer.

• The Warner Coupling Socket is serving all the way up the line — from the tiny jeep to the largest truck used by our armed forces.

For years, this proved-in-service socket has been standard equipment on many tractor-trailer fleets — used with our plug-in coupling cable to conduct current from tractor to trailer for brakes, tail light, stop light and running lights. To these standard functions, a wartime requirement has been added—blackout lights.

This sturdy socket is simple in construction—a heavy bakelite lining securely encased in steel, plated to resist rust. Contacts are provided for four separate circuits.

Although the needs of our armed forces come first, we can still supply Warner Electric Brakes and equipment if you are on the essential list.

WARNER ELECTRIC BRAKE MFG. CO.
BELOIT, WISCONSIN

BUY WAR BONDS

WARNER
ELECTRIC BRAKES

Fifteen million feet of Logs since 1940 ...with DIAMOND T *reliability*

THIS is a different kind of battlefield picture. It's in the heart of the timberland, far from gun-fire. But the battle is real—a sadly thinned army of loggers *must* get out the lumber to keep our fighting forces supplied. This mammoth load of straight-grained Sitka spruce is war material, vital to victory.

Here's what Jim Horne, the owner, writes:

"At 40,000 miles, figuring the engine had done 100,000 miles because of so much low-gear work, I had the motor taken down. Cylinders showed only two thousandths wear, so I installed rings and exhaust valves. Again at 80,000 road miles, the same story—only rings and exhaust valves were needed then.

"That decided me. I bought my second Diamond T 6-wheeler last March. It has run over 30,000 miles without needing even a new set of plugs. I've never seen any other trucks in log hauling with which I'd trade."

For nearly two years now, we of Diamond T have necessarily devoted our energies to the building of military vehicles for the United Nations. But fleets of earlier Diamond T's like this lumber carrier are working for Victory as truly as tanks and howitzers. The records which these veteran Diamond T's are making will be well remembered whenever experts gather to "talk truck" after Peace is won.

DIAMOND T MOTOR CAR CO., CHICAGO
Established 1905

DIAMOND T MOTOR TRUCKS

Two Million Ton-Miles at New Low Cost Per Mile
thanks to PENNSYLVANIA "TURNPIKES"

"What a record these Pennsylvania Turnpikes have set for us in our coal stripping operation," says Joseph Warren, of the Morocco & Warren Coal Company, Trafford, Pa. "We drop ton after ton of coal from our shovels onto these tires and drive them over ungraded roads. Yet after two million ton-miles last year on our nineteen trucks, these Pennsylvanias gave us the lowest tire cost per mile we ever had.

"Two years ago we switched to Pennsylvania Turnpikes. Now all our trucks carry Pennsylvania Turnpikes. As long as Pennsylvanias give us mileage like this, you won't find us specifying other tires."

★

For details about Pennsylvania Turnpike Tires, write direct to the Pennsylvania Rubber Co., Dept. CCJ-2, Jeannette, Penna., or see your Pennsylvania dealer. This same dealer will check your duals regularly with the scientific, new Pennsylvania "Match-Your-Duals" Gauge—an exclusive service to save you money.

★

PENNSYLVANIA TIRES

MANUFACTURED BY THE ORIGINATORS OF THE *Silent Vacuum Cup Tire*

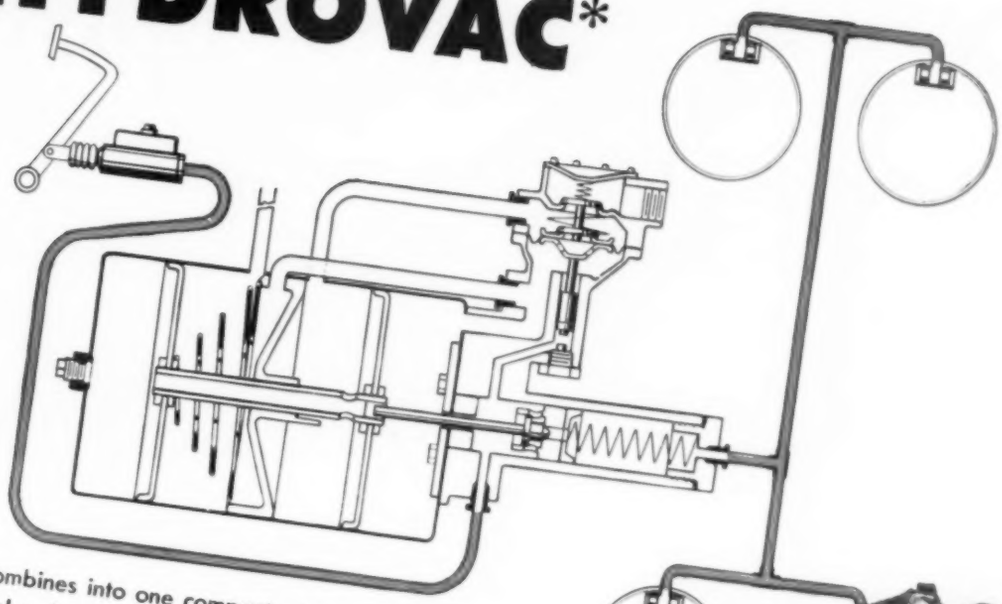
Pennsylvania is one of several associated companies operating the Copolymer Corporation at Baton Rouge, La., the first plant to produce synthetic rubber for the United States Government.

505

a Simpler System

FOR POST-WAR VACUUM POWER BRAKING

HYDROVAC*



Combines into one compact unit a vacuum control valve, a tandem-piston vacuum power cylinder and a hydraulic cylinder.

NO EXTERNAL LEVERS OR MOVING PARTS

The Hydrovac* unit, now on hundreds of thousands of military vehicles, is a member of "The Invisible Crew" of precision equipment, which more than 30 Bendix plants are speeding to world battle fronts.

The Hydrovac one-unit vacuum power brake system . . . Physical effort on the brake pedal hydraulically actuates the valve which controls the vacuum power cylinder. The power cylinder acts upon the Hydrovac hydraulic cylinder, providing ample hydraulic power for full brake application.

Easier to install and to maintain . . . a war-proved development for simpler vacuum power braking on postwar vehicles.

BENDIX PRODUCTS DIVISION
South Bend, Indiana

*Trademark of Bendix Aviation Corporation

THE INVISIBLE CREW
Precision Equipment by
Bendix Aviation Corporation

I've an idea that much of what I hear about the new synthetic tires is pure guesswork instead of fact. The multitude of statements claiming to present the truth about synthetic rubber all vary greatly. It's so confusing.

You hear rumors everywhere that synthetic tires will not give good service—that inner tubes can't be made of synthetic rubber; and if they are, that they will tear to pieces when punctured. I hear that synthetic tires won't hold up under full loads—that treads crack and split—and that they run hotter than a fire cracker, generally blowing out like one, too.

Gossip also is going around that synthetic tires don't stand up at regular highway speeds—that American manufacturers have not been able to perfect the synthetic rubber tire—and that the synthetic rubber program is as yet not a complete solution of the tire problem.

I'd like to know the honest truth about synthetic tires—some of the facts derived from someone's actual experience with them—then I'd know better what to advise my drivers and shop mechanics. I could tell them what to do and what not to do—and what to expect.

Possibly you can lead me out of this synthetic fog. If so, you certainly will do me a great favor

THE MANSFIELD TIRE & RUBBER

Manufacturers of the

MANSFIELD, CENTURY,

DISTRIBUTED THRU

Part of what you hear about synthetic tires may be true — a lot of it, isn't. I size it up mostly as back-track talk covering up for claims which were too bombastic in the beginning. And I think you will agree that's no way to build any customer's confidence.

For me, I'm glad I'm using synthetic tires made by Mansfield. I was told from the start that synthetic tires, no matter what make, are not yet an improvement over tires of natural rubber. I was told frankly that synthetic tires are as yet emergency tires, but if cared for and used properly, they would give a good account of themselves.

Of course, as the factory recommends, we do not overload, we check inflations regularly and we observe Government driving speed regulations. Those who have complied with these precautions have had no cause for complaints about the synthetic tires made by Mansfield.

I know that Mansfield has had more than a ring side seat in synthetic progress—in fact, they have been right in the arena of all of today's synthetic tire development. And when I was told that their synthetic tires were ready for the jobs expected of them, I believed it, and now my experience certainly has borne out that belief.

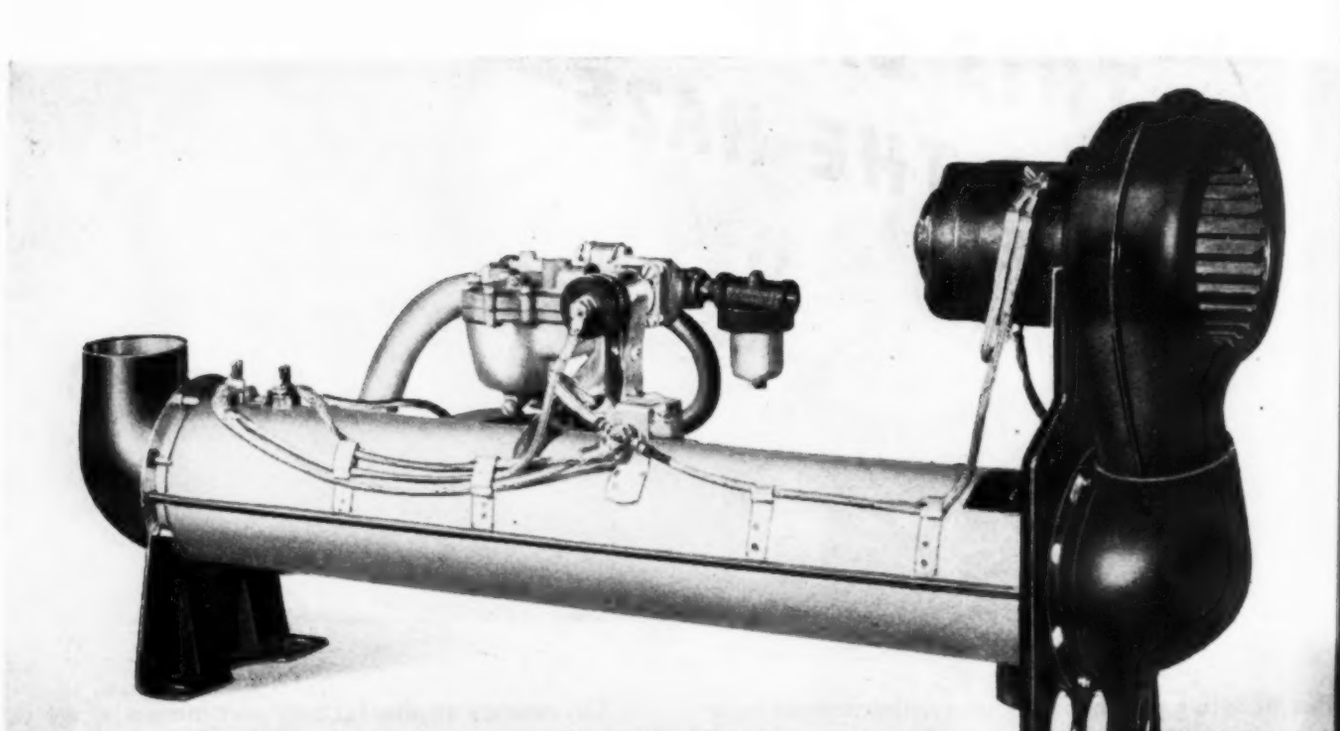
COMPANY, MANSFIELD, OHIO

Following Well Known Tires—

RICHLAND, UNITED

WHOLESALERS EXCLUSIVELY

Heat in a Hurry—Fr



Versatile new 905-Series South Wind

FOR STAND-BY HEATING...

New South Wind Model 905A is designed especially for heating of equipment. Unlike most South Winds, both heated air and exhaust heat are usually used . . . for example, by ducting the heated air to engine and battery and the exhaust heat to the differential.

Because it is designed for pre-warming cold engines and similar uses when engine is not operating, this model has been developed for unusually low power consumption—only 2½ amperes at 12 volts. It will start at 50° below zero and deliver 10,000 Btu/hr. total including exhaust heat. It is not recommended for heating personnel.

FOR PERSONNEL HEATING...

New Model 905B (6 volt) and 905E (24 volt) South Winds deliver 10,000 Btu/hr. without using exhaust-gas heat . . . ample for heating a large cab or the interior of small vehicles such as ambulances. Four of these compact units will heat a bus large enough for 50 to 60 war workers.

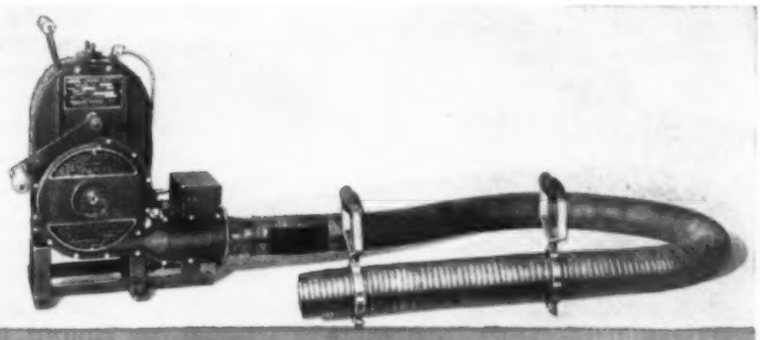
More powerful than Model 905A, these versions are for operation primarily while engine is running, and draw 60 watts. They embody special features adapting them for personnel heating—have enough power for ducting and for cold starting at 60° below zero. Exhaust gases could also be ducted for equipment heating if desired.

From Little Sources

From Pre-Heating Icy-Cold Engines to Warming Personnel There's A South Wind Tailor-Made to Your Heating Needs

FAST—SAFE—COMPACT—South Wind heaters provide a versatile answer to vehicle heating problems. These wartime developments of the famous peacetime South Wind car heater generate large volumes of heat from small sources by burning gasoline. In most models, the famous South Wind hermetic combustion "sealed-flame" principle is employed, so that contamination of heated air by combustion products is impossible.

South Wind models shown on these pages offer ideal heat sources for anything from pre-heating engines or transmission and differential grease to warming truck cabs, ambulances or buses. Like other South Winds, these have proved their performance and reliability under the most difficult conditions of climate and service. Other models are available if higher outputs are needed. Write for details, outlining your requirements.



Hot Heat at the Turn of a Crank

This completely independent, portable South Wind Model 796A carries its own fuel and delivers up to 40,000 Btu/hr. dependent on cranking speed. Provides instant heat for pre-heating engines, liquefying gear lubricants, heating manifold, warming battery or similar uses. 6-foot detachable accessory duct makes it easy to direct heat to where it is needed. This model does not employ the sealed-flame principle and is not for use in enclosed spaces.

Another Product of STEWART WARNER

South Wind Heaters

REG. U. S. PAT. OFF.

Heater Division, Stewart-Warner Corporation, Chicago 14, Illinois

ARMY NAVY

Go Ahead in '44 with *Speaker*

Speaker "Super Quality" Tire Repair Units

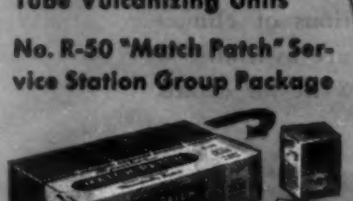
S5-5" Round

S-10

10x12" Truck Size

Speaker "Match Patch" Tube Vulcanizing Units

No. R-50 "Match Patch" Service Station Group Package



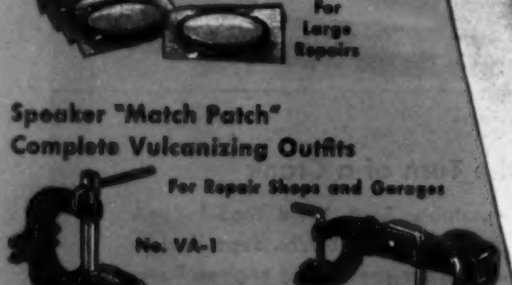
"4-Way Sealed"

"GU" Giant Universal "Match Patch"

For Large Repairs

Speaker "Match Patch" Complete Vulcanizing Outfits

For Repair Shops and Garages



No. VA-1

No. V-2

No. T-3

Motorists' Emergency Kit

More Important Than Ever . . . All Tube Repairs *MUST* be Vulcanized!

THE *Leading* AND *Complete* LINE OF SAFETY VULCANIZING TUBE and TIRE-REPAIR

The New Speaker "MATCH PATCH" No. 0-50 Group Package "4-Way Sealed"

HERE THEY ARE! The New SPEAKER "MATCH PATCH" Shop-and-Road GROUP PACKAGES . . . 4-WAY SEALED!

You get SPEAKER "MATCH PATCH" Tube Vulcanizing Repair Units at their best from the new SPEAKER GROUP PACKAGE, for repairing "flats" in your tire repair shop and alongside the road . . . because the "4-WAY SEALED" Group Package assures permanent protection of each "MATCH PATCH" right up to the time of use . . . under all atmospheric and climatic conditions.

The heat unit of each "MATCH PATCH" remains crisp and dry, in perfect condition . . . sure, easy lighting and peak vulcanizing heat are assured. The rubber remains in uncured condition for proper adhesion and vulcanizing range. • Avoid costly delays caused by highway "flats" . . . equip every truck with the SPEAKER fleet vulcanizing repair outfit.

You can be certain to "keep 'em rolling" with SAFETY and on schedule by demanding genuine SPEAKER "MATCH PATCHES" in the new "Shop-and-Road Service" Group Packages . . . Round, Oblong, Giant Oval.

SPEAK TO YOUR JOBBER ABOUT SPEAKER

Speaker jobbers are serving well the thousands of fleets, with the complete line of Speaker "MATCH PATCH" vulcanizing units and equipment. "MATCH PATCH" vulcanizing units, more than ever, are needed for crude as well as synthetic tube repairs. Get your "MATCH PATCH" units and vulcanizing equipment from the nearest SPEAKER jobber. Do your part to aid rubber conservation and increase tire mileage.

SPEAKER QUALITY

J. W. SPEAKER CORPORATION

3059 NORTH WEIL STREET
MILWAUKEE 12, WISCONSIN

They practice what they preach

Here in the oil fields, operators talk and produce in terms of thousands of barrels. But when it comes to consumption of these vital stores of petroleum—then these same men are just like any "A" book holder down to his last coupon.

This vigilance against waste is not just a war expediency. It began long before the hooked cross spread its tentacles over the world . . . and its beginning was marked by the introduction of Cummins Diesel Power in the oil fields because it was found to be "Faster and Cheaper than Steam."

Today, in every major producing area, Cummins Dependable Diesels are in the forefront of the petroleum industry's fight to achieve maximum production with maximum economy . . . not only economy in the consumption of fuels and lubricants, but also economy of time, materials and manpower.

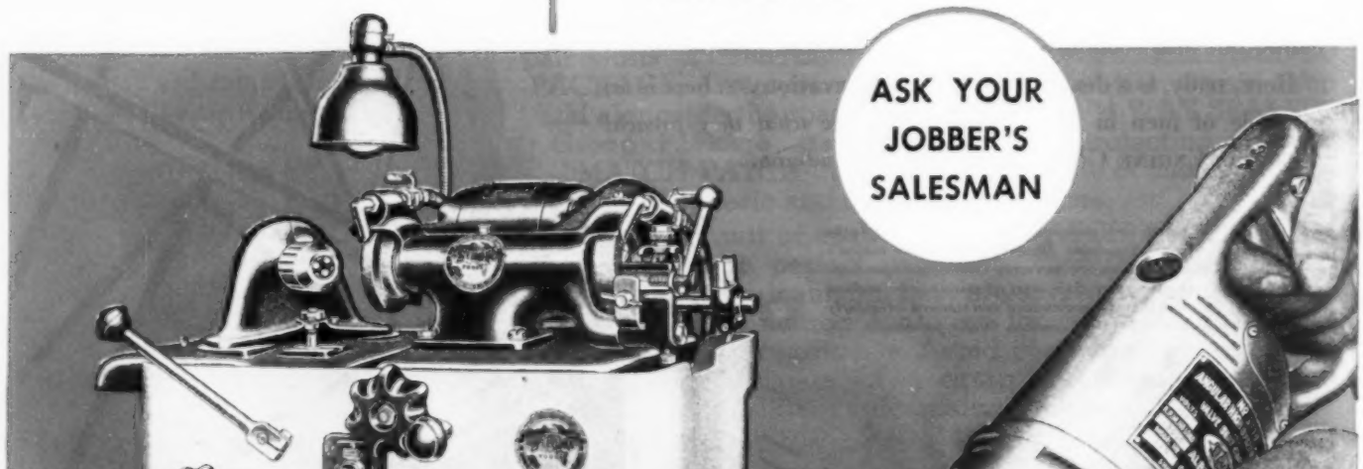
Here, truly, is a demonstration of conservation . . . here is an example of men in industry who *practice what they preach!*
CUMMINS ENGINE COMPANY, Columbus, Indiana.

This is the fourth in a series of advertisements depicting the war-time role of Cummins Diesel Power in the nation's basic industries. If you are operating Cummins Dependable Diesels, you can assure their most effective use by making doubly sure that they are maintained and serviced—regularly and efficiently. Ask your Cummins Dealer for details.

THEY "GOTTA GO!"

● Essential war transportation demands that all Trucks, Busses and Motor Cars be kept in running condition.

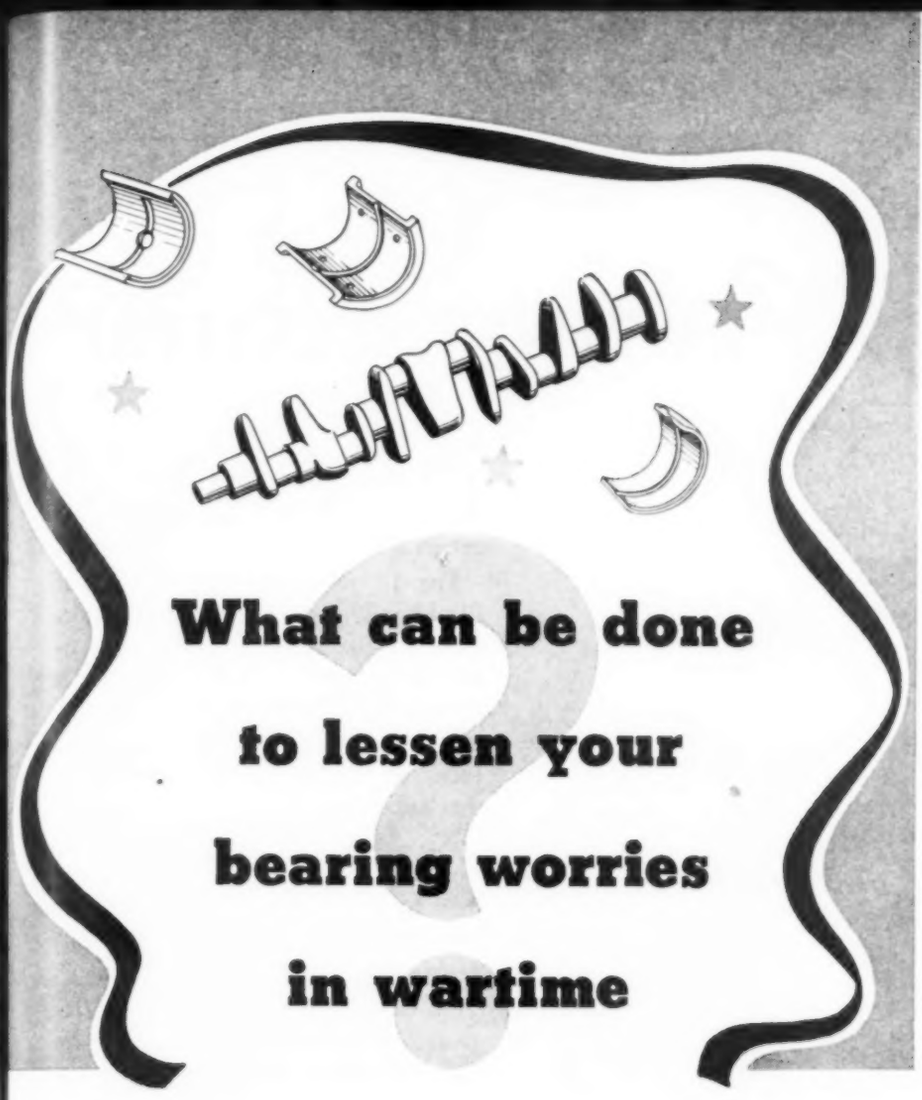
For factory precision, smoother jobs and finer finish . . . quickly, easily and economically when refacing valves and reseating valve seats, you can depend on SIOUX Valve Face Grinding Machine WET GRINDER and SIOUX Dual Action VALVE SEAT GRINDER.



SIOUX TOOLS

STANDARD THE WORLD OVER

ALBERTSON & CO., INC. SIOUX CITY, IOWA, U. S. A.



What can be done to lessen your bearing worries in wartime

• THERE ARE many reasons why you may find bearing problems increasing today. Many of the metals which gave prewar bearings long life are needed for the war effort. Many types of bearings now available are not suitable for heavy-duty service. Even under prewar operating conditions these bearings would tend to wear out faster. But today, loads are heavier. Maintenance is more difficult because of the manpower shortage. Longer hours of operation increase the load on bearings. Even prewar bearings are hard put to stand the gaff.

That makes the problem two-sided—how to make wartime bearings last longer, and how to keep prewar bearings on the job.

There is no simple solution. We show at the right a check list of steps that can be taken. While these do not offer new ideas in maintenance practice, they do have *new significance* today. A Standard Automotive Engineer can help you use this list to tighten up your shop practice to secure the utmost protection of your equipment.

A wartime oil for these wartime problems. Two of the most important items on the check list are—"Keep crankcase cleaner," and "Use the right grade and kind of motor oil." Hundreds of fleet operators have been turning to Stanolube H.D. Motor Oil in this emergency.

Stanolube H.D. has been available to the U.S. and fleet operators only since about the start of the war. Although civilian use of this is restricted, it is available to fleet operators because of the vital part they have in the war effort, and because of the severity of the service.

Stanolube H.D. is a detergent oil, but in addition, it is "heat-proofed" to retard oxidation. Therefore, it serves in *two* ways to prevent harmful deposits that cause bearings to wear out more quickly:
1. Because of its detergent properties, it holds fine dust and carbon particles in suspension so that they are removed when oil is drained. 2. The "heat-proofing"—inhibiting against oxidation—practically eliminates trouble resulting from oil oxidation products, another form of deposits particularly troublesome today.

More help on wartime bearing problems. Standard Automotive Engineers are working right now with other fleet operators on bearing problems just like yours. They will be glad to give you the benefit of their experience. You can reach one of these Engineers by calling the nearest Standard Oil Company (Indiana) office, or by writing 910 S. Michigan Avenue, Chicago 5, Ill. In Nebraska, address Standard Oil Company of Nebraska at Omaha 2.

A check list of suggestions for bearing maintenance

1. Use greater care in selecting bearing types and bearing materials best suited to your equipment.

2. Make sure that wartime shop practice gives extra care to proper fitting of bearings as recommended by manufacturers.

3. Check bearings more frequently for wear—an oil leak detector is one easy way.

4. Reduce detonation by:

a. Installing heavier cylinder head gaskets, or two regular gaskets
b. Retarding spark

5. Maintain proper engine temperatures:

a. Low enough to prevent damage to oil and bearings—especially important with wartime bearings—by:
(a) Increasing water circulation
(b) Keeping cooling system cleaner
(c) Keeping crankcase full

b. High enough to avoid dilution and water condensation—by:
(a) Covering radiator
(b) Reducing air circulation
(c) Insulating crankcase

6. Keep crankcase cleaner by:

a. More frequent oil changes
b. More frequent filter changes
c. Proper maintenance of crankcase ventilating system
d. Proper maintenance of air cleaner

7. Use the right grade and kind of motor oil

a. Grade: light enough for adequate cooling; heavy enough for protection
b. Kind: detergent to prevent deposits; stabilized to prevent oxidation and varnish formation.

Oil is Ammunition . . . Use it Wisely

STANDARD OIL COMPANY (INDIANA) STANDARD SERVICE

★ FLEET CONSERVATION SERVICE

Champs AT "SWEET SIXTEEN!"

IT'S A LONG, tough grind to the championship! It takes *time* to get to the top!

For 16 years, the men who used Blackhawk Jacks have had a lot to do with Blackhawk's being tops today in automotive circles. They told us what they'd *like* in jacks! We listened—looked—and built Blackhawk Jacks to take the abuse and misuse that are a part of the tough, rush jobs.

No mechanic *likes* to abuse jacks. But some times they *have to.* And they have a deep-down liking for Blackhawk Jacks because they *have proved they can take it!*

Now, *service-proved for sixteen years,* Blackhawk Jacks have an unmatched record that comes from growing up the *hard* way—and being built to take it!

When you need a jack — buy the best — buy a Blackhawk!

BLACKHAWK MFG. COMPANY
Dept. J724, Milwaukee 1, Wis.

This seal is found ONLY on BLACKHAWK JACKS — your assurance of a wise and safe investment.

BLACKHAWK

FLEET OWNER

DEVOTED TO THE BETTER OPERATION AND MAINTENANCE OF ALL AUTOMOTIVE FLEETS

Vol. 32, No. 2—February, 1944

WASHINGTON REVIEW

(The Editor's Column)

A MILLION TRUCKS IN '44

● Absolute assurance that the civilian truck-using industry will get its 80,000-odd trucks and 25,000 trailers in 1944, as reported here last month, is seen in a formal order issued last month by WPB, calling for the production of more than 1,000,000 trucks and truck-trailers, for military *and* civilian use, during 1944. . . . The order, known as L-1-E, literally puts a "must" in the truck production program announced in our last issue, because it provides that production and shipment of all vehicles *must* be made without regard to preference ratings or directions of any government agency other than WPB itself. . . . The authorizations to manufacture the various civilian trucks, as issued by WPB, were published on page 44 of our last issue, and although this is subject to variation and change from time to time, there is little likelihood of the 80,000 civilian truck figure being increased; also the trailer figure, although rumors have been ripe all over the place, declaring that the number for civilians might be greater than initially announced.

In order to secure production on time of various components going into trucks and trailers and other products using automotive-type components, the order provides that WPB, as the necessity arises, will issue specific directions to suppliers of components which will fit the timing of their production into the schedules for the end products. . . . The components covered by the order are axles, clutches, brakes, propeller-shafts, rims, transfer-cases, transmissions and wheels. Other components may be added to the list if required. . . . Before any such directions are issued to suppliers of components, a thorough consultation will be had with them to ascertain the effect of the proposed production upon other important programs at their plants.

No producer or supplier will be permitted, except when authorized by WPB, to accept an order for any product, the production of which will delay or interfere with his "frozen" schedule under the order, nor may any producer or supplier place an order with another supplier for a total quantity of any component in excess of his actual requirements.

A large part of the work in preparing component schedules will be done at the Tank and Automotive Center of the Ordnance Department, Union Guardian Building, Detroit, but the schedules, themselves, will be issued from the Automotive Division of WPB in Washington.

The order also assigns a preference rating of AA-1 to producers of motor trucks and truck-trailers and suppliers of components for material entering into the production of these items. . . . All trucks and truck-trailers produced under the terms of the order, except those on orders for the United States Army or Navy, will, upon completion, be held subject to the rationing procedures of Conservation Order M-100. This will assure that these new vehicles will be put to the best possible use in the war effort.

Simultaneous with the issuance of this order, designated as Limitation Order L-1-E, WPB also announced the revocation of Limitation Order L-1-G, which had prohibited the production of truck-trailers after June 30, 1943, except for the war agencies and as specifically authorized by the Director General for Operations. . . . Truck trailers will hereafter also be produced under the terms of Limitation Order L-1-E.

WASHINGTON REVIEW . . . .

Continued from Page 45

NO MORE "WAR" VALVES

● Automotive intake and exhaust valves for civilian use again will be manufactured with the pre-war quantity of chromium and nickel. . . . WPB, announcing the revocation of Limitation Order L-128, which restricted the use of these materials in automotive valves, said that since additional quantities of the metals had become available, it was possible to place civilian users on the same footing as the Army, Navy, Maritime Commission and War Shipping Board, which have been exempt from the provisions of the order.

●

VANIMAN'S STATEMENT

● While on the subject of truck production and the WPB, it is interesting to note the remarks of R. L. Vaniman, who recently resigned from the post of Chief of the Automotive Division of WPB and is now a vice-president of Fruehauf Trailer. . . . In making his first statement to the press as a civilian employee, Mr. Vaniman reviewed the events transpiring since the beginning of the war, told how it was only logical to stop truck production in order to meet the urgent situation which then faced the country, but emphasized that while lots of stress had been placed upon production of war machines, home-front transportation was literally frozen and subsequently forgotten.

The result, he said, was inevitable, leading to transportation breakdowns here and there and threats of a wholesale breakdown as time went on. . . . Because essential vehicles have been literally burned up on the farms, in the forests, in the mines and over the highways during the past two years, having been run more miles, carrying bigger loads and being in more constant use than ever before, and because at the same time replacement

THIS is precious cargo, indeed. . . . It's a Heil-built Army Air Corps refueling unit being unloaded in Iceland. . . . These units are helping "keep 'em flying" on every flying front all over the world.

parts have been scarce and the manpower necessary to maintain such vehicles even scarcer, the government has finally recognized the situation. . . . Mr. Vaniman called the 1944 civilian truck production schedule merely a "token" move towards partial solution of this important problem, remarking that the program is not nearly big enough and that it is questionable whether production will be accomplishel soon enough to avert a major crisis in transportation. . . . There is only one way, said Mr. Vaniman, to cure this situation, and that is for those at Washington to know that public opinion has been aroused. His opinion is that the civilian truck production program that we have today, inadequate as it is, would not have been scheduled if it had not been for widespread comments in the press regarding the situation — so forcefully, that something *had* to be done about it. . . . Summing up, Mr. Vaniman declared (and he *should* know) that it is not enough. "We should have a program several times as large, and the consequences of neglect in that direction may still result in a disastrous effect upon our war operations". . . . So there you have it, direct from the horse's mouth, as they say. . . . Here's hoping that the current "abundance" in such metals as steel, copper, etc., will result in more trucks and trailers, rather than more flat-irons, pots, pans or baby buggies. . . . They certainly *will* be needed.

●

MORE ABOUT TRUCK CEILINGS

● OPA has recently extended its previously published list of base prices of motor trucks, under the used truck ceiling price program, by adding approximately 4,000 prices of truck models previously unlisted. . . . The listing, as you know, includes a so-called "base-price" based on value-when-new. . . . The list of base prices has also been revised, eliminating errors and duplications, as well as freight, tax and handling charges. . . . Additional information is supplied by including tire sizes and tire equipment, which are factors to be considered in determining the base price when they are standard equipment. . . . The list of freight rates has also been extended, including additional cities. . . . All of this is contained in Amendment No. 1 to MPR No. 341. . . . The extended list is now available to all dealers and fleet operators, combined with a "data book" which contains a digest of the regulation, questions and answers, and suggestions to help you conform with the regulation. . . . You can get a copy from your nearest OPA district or regional office.

●

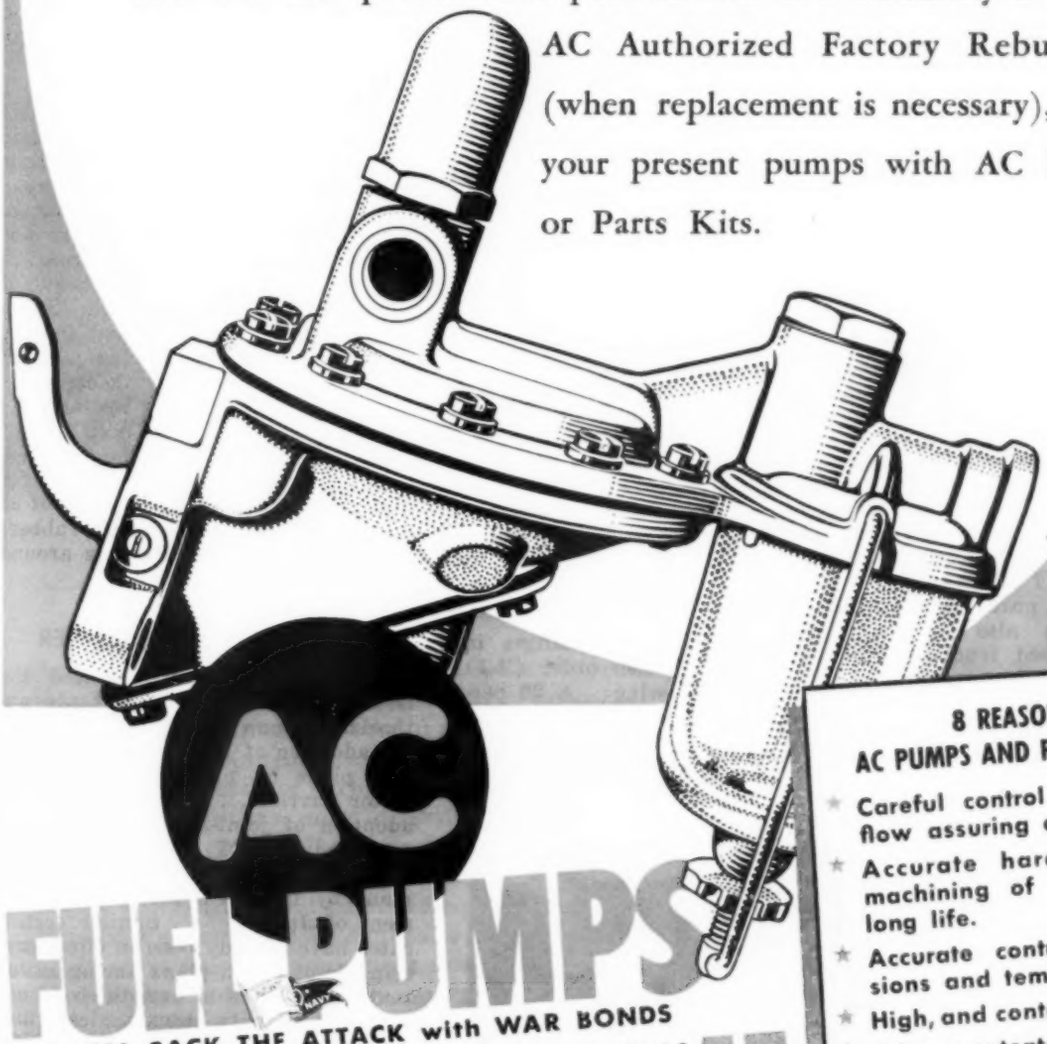
WHEN BUYING USED TRUCKS

● As you know, under the used truck ceiling price regulation, both buyer *and* seller must sign a certificate of transfer showing all terms of the sale and declaring that the maximum price ruling has not been violated. . . . Without this certificate, you may not be able to get gasoline for use in the vehicle, if you are the buyer, and we understand that the OPA is checking every certificate in full detail, even to figuring out the ceiling price from the book. . . . So, before you buy a used truck, make sure that the price is within the ceiling—for various reasons—and make sure that the certificate of transfer is properly filled out. . . . When a truck is sold to a dealer by an individual, no certificate is needed, but it *is* required on sales between individual owners and when a dealer sells a truck to an operator.

OVER 12,000 Railway Express trucks throughout the country, in 6,000 cities and villages, are carrying this special poster, tying up with the Treasury Department's 4th War Loan drive. . . . The poster space is contributed by Railway Express Agency, in conjunction with Douglas Leigh Poster Advertising. . . . Send in your truck picture; we'll print it.

PROTECTION FOR
The Heart of the Fuel System

You get reliable performance and long life from your AC Fuel Pumps because *the quality is built in,* from blueprints to finished products. You will best protect that performance and durability if you install AC Authorized Factory Rebuilt Pumps (when replacement is necessary), or rebuild your present pumps with AC Diaphragm or Parts Kits.



AC FUEL PUMPS

Let's ALL BACK THE ATTACK with WAR BONDS

8 REASONS WHY AC PUMPS AND PARTS ARE SAFEST

- ★ Careful control of pressure and flow assuring correct fuel supply.
- ★ Accurate hardening, precision machining of parts essential to long life.
- ★ Accurate control of spring tensions and temper.
- ★ High, and controlled, pin hardness.
- ★ 4-layer, patented-impregnation diaphragms of special airplane cloth.
- ★ Carefully finished rocker arm pads, located to center on cam.
- ★ Split-hair rocker arm clearance and control of pad hardness.
- ★ Uniform pull rod hardness at pin holes.

SEND FOR AC SHOP MANUALS

Field Service Department, AC Spark Plug Division, G. M. Corp. FO-2
910 Union Industrial Building, Flint, 3, Michigan

Gentlemen: Please send at once, no charge, the AC Shop Manuals checked:

- ☐ How to Service Spark Plugs
- ☐ How to Service Spark Plug Cleaner
- ☐ How to Service Oil Filters
- ☐ HOW TO SERVICE FUEL PUMPS
- ☐ How to Service Air Cleaners
- ☐ How to Service Speedometers
- ☐ How to Service Ammeters and other Instruments

NAME_____
FIRM_____
STREET ADDRESS_____ STATE_____
CITY_____

WASHINGTON REVIEW ....

Continued from Page 46

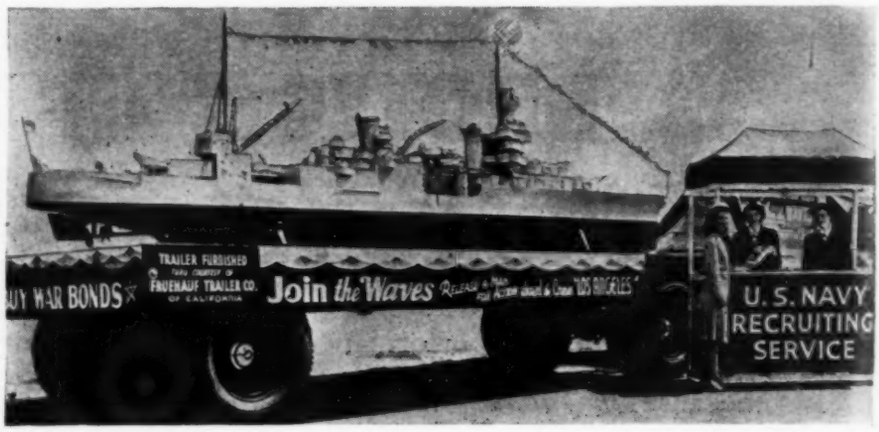
TO RATION USED CARS?

● If you've had your eye on some "good buy" in a used car, better pick it up before it may be a little more difficult to do so, as far as red tape is concerned. . . . There is considerable talk going the rounds that used cars will soon be placed under both maximum price regulation and rationing. . . . In other words, it appears that all cars will be "frozen" in the hands of their present owners. Should an individual desire to sell his car, he may only do so to a dealer, or to a person with a ration certificate, obtainable in the usual manner from a local ration board. . . . The boys who *should* know say that we can expect this to be put into effect next month and that the table of price ceilings is already figured out. . . . So, if you want a used car, you can get it today without red tape. If you wait, you will need a certificate; but then too, you might be able to buy it under rationing at a better price. . . . We don't know.

●

WANT SOME ARMY TRUCKS?

● All persons who are planning to purchase trucks placed on sale by Army salvage officers as no longer suitable for military use, were advised last month by ODT to consult their ODT Motor Transport district office, *before* bidding on such equipment. . . . Several cases have occurred, ODT said, where persons have purchased trucks and then found the proposed services were of a nature that would not qualify them for allotments of motor fuel and mileage. . . . The ODT warning on purchases of Army trucks applies also to would-be purchasers of used trucks of *any* kind. Such a purchase should not be made until the prospective buyer makes certain that a Certificate of War Necessity, required for operating any kind of commercial motor vehicle, will be issued by the ODT for the type of service in which the truck is to be used. . . . If the vehicles are to be used in "for-hire" carrier services for which Federal or State certificates are required, it will be necessary to submit evidence of such authorizations when applying for Certificates of War Necessity. . . . By checking with the ODT, prospective purchasers of such trucks can avoid possible financial loss from buying vehicles for which they will be unable to obtain gasoline allocations, the ODT pointed out. . . . ODT district managers have been instructed to advise inquirers informally whether or not Certificates of War Necessity will be granted and gasoline and mileage certified, in the event they purchase vehicles. . . . The ODT warned also that persons contemplating setting up new business enterprises, or enlarging present businesses, where the use of motor vehicles would be involved, should likewise consult ODT district offices for the same reason. . . . Under amendments to ODT general orders, the ODT will not issue gasoline for new or enlarged truck operations unless they are adjudged necessary to the war effort or to the essential civilian economy. . . . A person starting a new business or expanding an established business involving truck operations might find too late that he could not obtain the necessary gasoline if he failed to consult the ODT in advance. This might result in financial loss to such a person.



THIS miniature battleship helps recruit WAVES. . . . It's an exact 25-foot replica of a U. S. Navy heavy cruiser, mounted on a Fruehauf flat-bed trailer, which is now touring the streets of the country, helping to recruit women for the Navy, as well as to sell War Bonds. . . . The model was made by MGM Studios and has guns and turrets that work.

●

CHANGES IN RUBBER ORDER

● Among the many changes in the revised basic rubber order (R-1) are noted the following: A 20 percent reduction in the crude rubber content of truck tubes of 10.00 cross-section has been provided; formerly a maximum of approximately 80 percent crude by volume was permitted; the maximum now allowed is about 64 percent crude. . . . Sufficient rayon cord is now available, according to WPB, to permit its use in city bus tires and in inter-city truck tires. . . . Previously such tires were required to be made of cotton cord. . . . Scrap tires may now be purchased for the manufacture of tire patches and reliners, through normal trade channels. . . . Tire manufacturers are now required to use a cord-dip composed of about 50 percent synthetic or reclaimed rubber. . . . Combat tires (for Army use) are now being made of as high as 95 percent synthetic rubber; formerly the percentage was around 30.

THE navy now has a vehicle maintenance school, sponsored by International Harvester. . . . Here Fowler McCormick, president of IHC, watches two students do their stuff in the automotive engine section.

●

JOINT ACTION MADE EASIER

● ODT recently announced the issuance of a blanket certificate authorizing a new procedure to expedite the adoption of joint-action conservation plans by private and contract motor carriers. . . . It permits the adoption of joint-action plans, when approved by ODT, without the necessity of separate approval of such plans by the WPB and the Department of Justice. . . . Similar certificates have already been in effect covering joint-action plans among motor common carriers in over-the-road operations, intercity buses, taxicabs and retail dealers in solid fuels. . . . ODT points out that joint-action plans among private carriers may be adopted without its approval, but when that is done, the participants will not have the immunity provided under the formal procedure. . . . In such instances, the plan should conform to the standards set forth in the joint statement of the ODT and the Department of Justice, dated March 12, 1942, and a copy of the plan should be filed with ODT.

KEEPING AMERICA STRONG

America owes no small debt of gratitude if not its very sustenance to countless thousands of nocturnal messengers . . . those carriers of the nation's milk supply ★ Piercing the hinterland, whisking over broad highways, these harbingers of health present one of the world's most diversified operations. Safety, dependability, and economy . . . watchwords of the industry, naturally call for highly specialized, well balanced equipment. That Bendix-Westinghouse Air Brakes have found universal favor as standard equipment among the leaders in this vital industry is high compliment indeed, but not without merit ★ Bendix-Westinghouse has for years worked closely with the Milk Cartage Industry. Its engineers have studied and perfected Brakes and Pneumatic Controls which have later served conspicuously in other fields of transportation. In view of the intimate role it has been privileged to play in the evolution and current perfection of this vast industry, Bendix-Westinghouse takes particular pride in its ability to continue its research and serve with the recognized leaders in this and allied fields ★ Quite possibly your control problem deserves this same engineering touch which is yours without obligation. May we suggest you contact your local Bendix-Westinghouse Distributor or write direct to the manufacturer for complete information?

BENDIX-WESTINGHOUSE AUTOMOTIVE AIR BRAKE COMPANY . . . ELYRIA, OHIO

Bendix-Westinghouse

AIR BRAKES

AND PNEUMATIC CONTROL DEVICES

IT IS SIGNIFICANT THAT AMERICA'S FINEST MOTOR TRUCK FLEETS ARE EQUIPPED WITH BENDIX-WESTINGHOUSE AIR BRAKES

WASHINGTON REVIEW ....

Continued from Page 48

MAY USE BIGGER TRUCK

● The substitution by a truck operator of a larger truck for a smaller one, or of a truck for an automobile used to transport property, does *not* violate the requirement for prior approval by ODT of any extension or inauguration of service, ODT explained recently, in an interpretation of the rule against extension of operations. . . . If the operator continues his operations with the substitute vehicle over the same routes or in the same territory which he was serving on October 25, 1943, he can use *any* vehicle. . . . The rule prohibits only an extension or inauguration of service over routes or in territory not being served by the carrier on that date.

●

MUST RETURN GAS COUPONS

● A plan to establish more effective control over the return of unused gasoline ration coupons for an estimated 200,000 vehicles in the U. S. that change ownership each month, went into operation the first of this year. It calls for close cooperation between State motor vehicle departments, through which applications for new vehicle registrations must be made, and War Price and Rationing Boards. A close check will be made to see that outstanding gasoline coupons for a vehicle to be sold are returned to the ration board before the vehicle is transferred.

Before selling his vehicle, the present owner will send or take any coupons issued for the vehicle that remain in his possession to his ration board and obtain a receipt in duplicate. The original copy of the receipt will be sent to the State motor vehicle registration department with the new owner's application for registration. The purchaser must use the duplicate of this receipt when he applies to his ration board for gasoline rations.

Dealers and other persons holding new or used vehicles, including passenger-cars, commercial vehicles or motorcycles for resale, were required to file an inventory with their ration boards of all such vehicles on hand as of the close of business December 31 and obtain a receipt for each vehicle. Beginning January 1, no vehicle is to be sold or transferred unless this receipt in duplicate is given to the purchaser at the same time. Scrap dealers must have on hand a receipt for each vehicle they receive beginning January 1. These receipts must be retained for at least one year if the vehicles are to be scrapped.

Beginning January 1, no board can issue rations for a motor vehicle that has changed ownership after December 31, unless the applicant submits the appropriate receipt. . . . This action seeks to strengthen means of bringing about full compliance with regulations already in effect, OPA said. Without such compliance the transfer of approximately 200,000 vehicles each month could mean the diversion of a substantial quantity of gasoline to unlawful uses.

GIRL clerks in the parts department at White's Chicago branch use roller skates to get around. . . . They have proved satisfactory replacements for men who have been called into the U. S. Armed Forces.

●

OCTANE-NUMBER DECLINES

● The average octane-number of gasoline sold to the automotive public of the U. S. declined slightly during the summer of 1943, according to a survey made by the Bureau of Mines. . . . Based on analyses of 775 service station samples (the products of many companies) the report disclosed that the average octane-number of premium fuel had dropped from 79.6 to 79.1 since the last survey was made last winter. . . . Similarly, average octane-number of regular fuel decreased from 72.5 to 72.0 during the same period. . . . In another report, issued by PAW, regular gasoline has been set at a minimum and maximum octane-rating of 72 in the East Coast States. . . . Similarly, premium fuel for these states must have a minimum and maximum rating of 76-octane. . . . The remainder of the country, says PAW, is only affected by the maximum ratings of 72 and 76. . . . You can believe what you will on this subject; there's the story on what you are *supposed* to get.

●

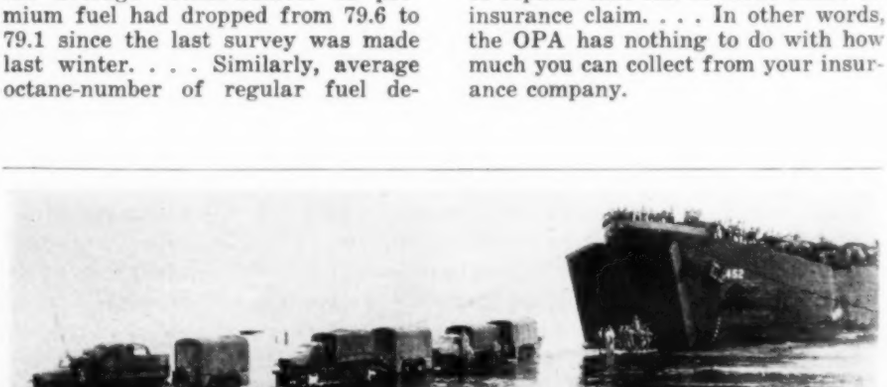
MUST GET STATE O.K.

● Operators of for-hire commercial vehicles seeking ODT authority either to institute a new service or to extend present operations, must first secure approval of interested regulatory bodies. . . . In other words, such applications must first have been cleared by state or municipal authorities having such jurisdiction. . . . And the application to the ODT must also make a clear showing that the operation in question is "necessary to the war effort or to the maintenance of essential civilian economy," the ODT warns.

●

THE OPA AND INSURANCE

● The adjustment of losses due to fire, theft or collisions, so far as used motor trucks are concerned, are *not* governed by OPA ceiling prices under MPR No. 341, according to an OPA ruling. . . . Such adjustments for losses are *not* considered as a sale, purchase or delivery of a used vehicle and there is no limit to the amount of repairs that can be made under an insurance claim. . . . In other words, the OPA has nothing to do with how much you can collect from your insurance company.



THIS seagoing "kangaroo" totes trucks and trailers. And when the big LST boat opens its "pouch", out roll complete Army units, ready to roll over a steel mat and carry supplies ashore. . . . The operation pictured is at Kiriwina Island in the South Pacific, 'tis said. The steel mat has been laid under water to permit trucks to negotiate the sandy beach.

For Motors that Must Not Fail...

the U. S. Army Specifies these 3 Oil Filter "Musts" for its Vehicles . . .

Here's a fact worth remembering when you buy filters or cartridges for your fleet: U. S. Army specifications—for motors that *must not* fail—call for oil filters which (1) are of the clean oil type; (2) are of the replacement cartridge type; (3) have an outside-in-flow—*three principles pioneered by Fram!*

So, to save motors, parts, oil, overhauls, dollars and delays on *your* fleet—isn't it common sense to get the filter that embodies *all three* of these basic principles? You take no risk—Fram protects you with this iron-clad guarantee: Put Fram Oil & Motor Cleaners on your fleet and operate for 90 days on regular schedule. Then, if *you* are not convinced that Fram saves many times its small cost, we'll gladly refund your money.

If your fleet already has filters, step up performance with genuine Fram Replacement Cartridges. They keep oil clean by filtering out dust, dirt, carbon, and sludge, while Fram's exclusive chemical treatment impedes formation of harmful acids and corrosives that eat away motor parts. Fram Corporation, Providence, R. I. Canadian Distributor: J. C. Adams Co., Ltd., Toronto, Ont.

"HOW'S YOUR OIL FILTER?"

The Dip-Stick Tells the Story

WASHINGTON REVIEW ....

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ERIE, Pa., is the setting for this latest Fruehauf Trailer factory branch. . . . It includes a service shop, display room and storage lot. . . . The new branch is under the managership of C. C. Eldridge.

THIS is known in Army language as one of the new "decontaminating trucks", of 400-gal. capacity. . . . It's used to clear up things after gas attacks—when and if. The men wear impregnated, anti-gas clothes.

WAR TIRES BACK TO "III"

● Car tires manufactured principally from reclaimed rubber (war tires) have been reclassified back to Grade III, which includes used tires. . . . Those now eligible for such tires include: (1) Car drivers with gasoline ration books issued for occupational driving. (2) Operators of commercial vehicles which deliver medical supplies, drugs, dry cleaning and essential foods. Also included are those vehicles used exclusively by medical or dental laboratories; that is, those vehicles which can use passenger-car tire sizes.

●

PARTS PRICING SIMPLIFIED

● Last month the OPA simplified the methods of pricing automotive parts previously established for manufacturers in an action known as Amendment No. 2 to MPR No. 452.

Neither the established pricing policy nor the level of maximum prices is substantially changed by any of the steps taken. In general, the list or non-list prices in effect on March 31, 1942, remain, without change, the maximums for automotive parts. . . . This action, however, will eliminate some of the expenses resulting from previously required "paper-work" by adoption of a simpler method for listing prices. Another feature facilitates normal handling of transactions while final approval of a new price is pending.

In connection with the latter change, OPA now permits a manufacturer to accept payment at a proposed new price and to refund, or collect, on the basis of the ceiling finally approved by OPA. Previously the manufacturer could charge or bill the proposed new price, but could not accept payment at this price for 30 days or until the proposed new price had been acted upon by OPA.

One example of the importance of the change to the manufacturer is that it will encourage him to resume production of parts for obsolete vehicles, and to deliver them immediately to meet an emergency while his proposed price is awaiting OPA's action. OPA emphasized, however, that this feature applies only to new prices and not to applications for adjustments of ceilings already established, which continue to require OPA approval before they can be collected.

Since the list and non-list prices are the basis for parts pricing, OPA revised the definitions of these terms in line with the trade's understanding of them. List prices, accordingly, are now simply defined as prices derived from a manufacturer's published and generally distributed catalogs, price lists, and discount sheets.

To preserve price stability, prices quoted or charged more than twice during the six months prior to March 31, 1942, are to be considered as the maximum non-list prices. Previously many of these quoted prices were considered list prices. . . . Other pricing improvements include the following:

1. Requirements for recomputation of maximum prices when the cost estimates were based on inaccuracies are removed, thereby eliminating the necessity of a considerable amount of accounting and paper-work.

2. Purchase costs in the case of a purchased part are made comparable to factory costs in the situation which requires or permits a manufacturer to establish a new list price. The regulation now provides that when a specification change or material substitution results in a change of ten per cent in factory costs or purchase costs, the manufacturer must, where it is a decrease, and may, where it is an increase, establish a new ceiling for the part.

3. In the case of cost reductions, however, the manufacturer does not now have to establish a new list price until the ten per cent reduction in costs amounts to five cents or more for the set or other unit of sale. This will eliminate repricing in many cases where reductions are inconsequential.

4. List prices for new parts or parts which previously had non-list prices and for which list prices are not required by the regulation, may now be established at the option of the manufacturer.

5. Suggested resale prices may now be determined by a definite procedure, in keeping with the manufacturer's past practice.

The definition of manufacturer has also been revised. A seller of purchased parts who sells them under his own parts number and for which he lists resale prices in catalogs and price lists is definitely considered a manufacturer, but his supplier is not required to furnish catalogs and price lists to customers who resell the parts under their own parts number and under their own price lists.

In another move designed to save costs of paper and printing, OPA changed the notification requirements of the regulation. Manufacturers are now permitted to notify a reseller of the resale prices by placing the prices on the sales invoices in those cases when he would not ordinarily furnish the reseller with catalogs and price lists. The same procedure may be followed when the part happens to be one for which an old list price has been re-established as a new list price, such as the part for an old model for which orders are few and non-recurrent.

Moreover, manufacturers are no longer required to place a notice regarding maximum prices on each invoice. It is felt by OPA that the catalogs, price lists and notice of all revisions are adequate to inform resellers of maximum resale prices.

A specified method for adjusting resale list prices for parts whenever a manufacturer receives an adjustment in his list price has also been provided.

OLD and new. . . . The top truck is a 1912 White dumper. It was replaced by this more modern White unit in 1936. . . . The old job is said to be the first dumper to be used in the New England states.

BACK THE ATTACK
BUY WAR BONDS
HELPS SAVE GAS BY LOCATING FAULTY AND INCORRECT PLUGS
TOO HOT
TOO HOT
IF YOUR SPARK PLUGS LOOK LIKE THIS THEY ARE OPERATING TOO HOT AND MAY BE CAUSING LOSS OF POWER
NORMAL
REFER TO PLUG CHEK DATA BOOK FOR DETAILED INFORMATION
AUTO-LITE "PLUG-CHEK" INDICATOR
TOO COLD
TOO COLD
IF YOUR SPARK PLUGS LOOK LIKE THIS YOU ARE PROBABLY USING TOO MUCH GAS, TOO MUCH OIL OR BOTH
AUTO-LITE SPARK PLUGS
DETOUR
ROAD UNDER CONSTRUCTION

DOING A BIG JOB

—in helping keep essential wheels turning on American Highways

HERE'S WHAT FLEET OWNERS SAY ABOUT "PLUG-CHEK"

"An important tool in fighting gas waste;" "Helps us save gas formerly wasted by faulty plugs;" "Makes it easy to get right plug for the job;" "Helps train unskilled mechanics into spark plug experts".

Why not find out how Auto-Lite's "Plug-Chek" Inspection Service can help you get better operation and better economy from your fleet. Get a "Plug-Chek" Inspection Kit and put it to use in your own shop. It's FREE! Write for yours today to

TOLEDO, 1 **THE ELECTRIC AUTO-LITE COMPANY** OHIO
Merchandising Division

Tune In Auto-Lite's New Radio Show Starring Ronald Colman in "Everything for the Boys."—Tuesday Nights—NBC Network—122 Stations Coast-to-Coast.

AUTO-LITE SPARK PLUGS
IGNITION ENGINEERED BY IGNITION ENGINEERS

WASHINGTON REVIEW ....

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60,000-MILE TRADE-INS

● OPA has recently raised from 40,000 to 60,000 miles the minimum mileage that an applicant's present car must have been driven, before it can be considered unserviceable by local boards. . . . The same action also makes salesmen ineligible for new cars, and requests local boards to issue a purchase permit for a new car only to an applicant showing an immediate need for one. . . . Salesmen were also recently removed from the preferred mileage list for obtaining supplemental rations.

●

REVISE EMERGENCY PLANS

● ODT has asked the nation's bus and taxicab fleet operators to revise their existing plans for possible emergency curtailment of mileage in the "critical" months ahead. . . . This request is directed only to operators of fleets of 10-or-more rubber-borne passenger vehicles, who were asked last January to submit to the regional offices of ODT's Division of Local Transport, plans for a 10, 20 or 30 percent curtailment of mileage in the event of emergency. . . . During the summer months, for example, you will recall that buses and taxicabs in the Eastern gasoline shortage area were ordered to put their 20 percent curtailment plan into effect to meet the emergency. . . . ODT emphasizes that the nation is approaching the most serious stage of the war in relation to domestic transportation and that the next few months are definitely going to be "critical" ones. . . . Operators are asked to cooperate, as before, with local and state regulatory bodies in planning for possible curtailments. . . . In making such revisions, the original mileage on which the curtailment plans were based should again be used. . . . In making the request, ODT declared: "Owing to the continued need of plans for limitations of service that may be compelled by urgencies that may arise, not alone with respect to rubber and gasoline, but for equipment, repair parts, manpower or for other reasons, each carrier is now requested to review the plans previously submitted and, based on the experience of the past eight months, to make such changes as may be indicated to bring the plans up-to-date."

GIRLS are good Diesel mechanics, according to Mack, which employs these two. . . . They work as a team and are shown putting the finishing touches on a 10-ton Army prime mover in Mack's New York factory.

●

MAY PICK-UP "EMPTIES"

● The ODT recently announced a ruling that the pick-up of empty bottles by dealers' trucks for reuse, is in line with the government's campaign to conserve glass containers, and is *not* prohibited by delivery limitations. . . . Retailers making deliveries of foodstuffs or beverages to household customers, under nation-wide delivery restrictions which became operative October 11, are permitted to collect empty containers so long as *no additional mileage* is operated, the ODT explained. . . . Consequently, the only restriction on the number of collections from household customers, under the ODT's ruling, is the provision limiting the number of deliveries of commodities to the customers. Pick-ups from a designated central collection point are limited by provisions which prohibit special deliveries and more than one delivery a day from any one point of origin to any one point of destination, with certain exceptions. . . . The ODT's interpretation of its delivery restrictions was made to clarify the problem of collecting empty bottles by motor truck, for the benefit of dealer and customer, and in furtherance of the bottle conservation program. . . . The order restricting local deliveries by motor vehicle, intended to conserve and maintain existing stocks of tires, parts, and the vehicles themselves to insure continued adequate service to the public, has led to some question as to how empty bottles may be returned to dealers for reuse.

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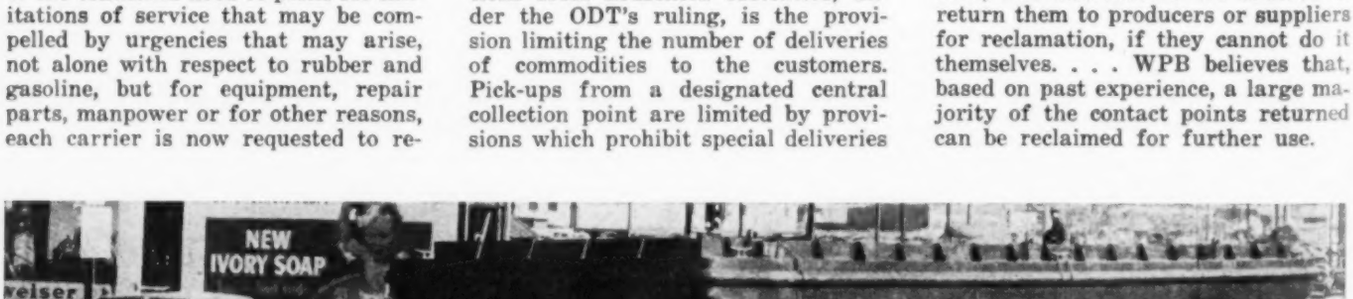
EXEMPT FROM OVERTIME

● Drivers, drivers' helpers, mechanics and loaders employed by common, contract or private carriers engaged in transportation in interstate commerce, are now considered by the U. S. Wage & Hour Division as *exempt* from the overtime provisions of the Fair Labor Standards Act. . . . The Division's position in extending the overtime exemption to these four types of employees of *private* carriers, even though the ICC has not yet found a need to regulate their employment, was taken because of a recent U. S. Supreme Court Decision. . . . For more details write to U. S. Department of Labor, Wage & Hour Division, Washington, D. C., asking for a copy of Interpretative Bulletin No. 9.

●

SALVAGE IGNITION POINTS

● WPB calls attention to the fact that there is a critical shortage of tungsten rod for ignition contact points, and says that salvage and reclamation are now imperative. . . . It is, of course, mandatory to trade-in old contact points when buying new ones, and distributors are ordered to return them to producers or suppliers for reclamation, if they cannot do it themselves. . . . WPB believes that, based on past experience, a large majority of the contact points returned can be reclaimed for further use.



DOWN to the sea in trucks! . . . That's how 60-ton Navy landing barges are hauled from remotely-located yards somewhere in California.

HE DRIVES A WEAPON

HERE'S A FIGHTER . . . the man in the cab of the truck. A fighter. On wheels. Through dismal days and storm-tossed nights he keeps his cargo rolling, whether it's two tons or twenty.

He's at it from dawn to dark and back again. More miles. More hours. More tonnage. More work than ever before. Proving, day after day on the highway, that a truck line is the shortest distance between two points!

He speeds food to market . . . he rushes vital war material from mine to mill, from sub-contractor to assembler, from factory to ordnance depot.

More than fifty thousand American communities would be stranded without the man in the cab of the truck. They would have no other way to get their goods out . . . no way to get goods in.

The truck he drives is two years old, at least. More likely it's six. But he carries on, in spite of shortages—of trucks, of repair parts, of gasoline, of tires, of manpower—shortages of nearly everything he needs in his business except the will to win. He drives a weapon. For his business is the same as the business of the man in uniform . . . it is the business of Victory.

A good share of the trucks which keep America's highways alive with the essential traffic of war are Internationals. Performance made them the *largest-selling heavy-duty trucks on the market.* And the same toughness, the same dependability, the same economy of operation that put them in the lead in the days of peace keeps them there in these days of war.

INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue
Chicago 1, Illinois

NEW TRUCKS—LIMITED!

The government has authorized the manufacture of a limited quantity of trucks for civilian hauling in essential occupations. For your new truck, see your International Dealer or Branch right away, and get valuable help in making out your application. Don't delay!

KEEP YOUR OLD TRUCKS ROLLING

It's a big job trucks are doing—a job they must keep on doing. That means *your* trucks must be maintained, must be kept in tip-top shape. International civilian truck service—the nation's *largest company-owned truck service organization*—is now a wartime service, more alert than ever. No matter what your make or model of truck, let International Dealers and Branches keep your trucks rolling on the warpath to Victory.

And boost *highway maintenance* in your community!

★

INTERNATIONAL Trucks

PART of Old Reading Brewery's fleet of 25 vehicles. . . . Note the lack of standardization.

ODT REGULATIONS A BOON

REDUCTION of DELIVERIES ENABLES US to DO MORE

HAVE ODT restrictions stymied you?. . . . If you feel that way, be sure to read this and see how they have actually helped this operator LOWER his costs. . . . For, as they say, "It's an ill wind," etc.—Editor.

WE HAVE often been asked the question, "How do wartime regulations and restrictions affect the operation and maintenance of your fleet?". . . The answer to that question is as follows: We are *still* able to maintain our fleet in first-class condition, and also to operate it at *no greater* cost per mile, even though ODT regulations have substantially reduced our mileage.

To accomplish this we have had to tighten our belts and give *more careful* attention to our preventive maintenance and tire conservation programs. I say "more careful", because we had been practising preventive maintenance and tire conservation for five years prior to Pearl Harbor.

Our fleet consists of 25 vehicles. We are now using six 5-tonners, four 3-tonners, one 1-tonner, one 7½-tonner and one 6½-tonner; all of these for local delivery service. And then we have six tractor-trailer combinations of 12-ton capacity, used for over-the-road transport service.

The equipment used for city delivery service operates within a 10-mile area of the City of Reading, supplying retail tap-rooms and taverns with both bottled and draught beer. The tractor-trailer units deliver the same products to our distributors who are located in Pennsylvania, New York, New Jersey, Maryland, Delaware, Virginia, West Virginia and the District of Columbia.

One regulation which has helped us to *lower* our costs materially is the "Frequency of Delivery" order, better known as ODT General Order No. 17. As a result of strict compliance with this order, our per-package delivery costs are now *lower* than they ever have been in the past. Besides, we now only use four trucks to make certain local deliveries, which were formerly made by eight trucks.

When ODT General Order No. 17 was imposed, we felt that it would be with us for the duration of the war. At least, it presented this new problem: "How to cover the same routes and yet give the amount of service permitted by the regulation?"

In the first place, our customers became resigned to the fact that only two deliveries would be permitted each week and that they must, therefore, take enough of our product on each delivery to last them until the next scheduled delivery. This meant larger per-customer deliveries and also the necessity of our using larger equipment.

Therefore, instead of using 3-ton capacity equipment, we now use one 7½-ton, one 6½-ton and two 5-ton trucks, which are loaded to capacity on each trip out of the brewery. We also found that by supplying each driver with a helper, we are able to cover all of our routes and still show a per-package reduction in cost.

The Frequency of Delivery order has also helped to lower the costs of delivery of our product to our vari-

THE shop where they "do it". . . . Note the tire inflation safety cage, at extreme right.

HERE is one of their newer additions (before Pearl Harbor) for over-the-road service.

TO THIS BREWERY FLEET

WITH LESS — TIGHTER BELTS and P.M. ARE FACTORS

By James A. Neary,
Traffic Mgr., Old Reading Brewery,
Reading, Pa.

ous customers, located outside of Reading. The distributor trips average 200 miles (round-trip) from Reading. And in the past it was a rare occasion when we could induce them to take a full load (12 tons) of beer. Now, however, each distributor always takes a full load.

We are definitely *in favor* of the Frequency of Delivery order, as we know that it has eliminated many costly delivery practices and has resulted in a large saving in delivery costs for us. Before this order was in effect, it was often necessary to make as many as two or three deliveries to a customer in one day. We knew that this practice was costly, but we were obliged to give this service or else one of our competitors would gladly step in and take over the customers.

When the order went into effect which banned the purchase of any new tire equipment by operators of private trucks engaged in the hauling and delivery of malt beverage products, we were fortunate in having practically new tire equipment on all of our vehicles.

We have tried by every means to make these tires last. On our city delivery trucks we have been very successful, and we have just sent our first two tires out for recapping. New tire mileage averages about 45,000 miles.

Over-the-road vehicles, because they travel a greater distance than the city trucks, have naturally required more recapping service. We are averaging 33,000 miles per recap on these vehicles. New tires have been giving us 40,000 miles on tractors and 60,000 miles on trailers. . . . Our tire conservation program consists of the following:

Every driver checks the air pressure before he leaves the garage. Pressure is also checked every Saturday, when a check is also made for cuts, nails, glass, etc. Any cuts that are found in a tire are filled with tire dough. If the cut is deep and extends into the cord body, the tire is removed and sent out to be vulcanized.

Dual tires are mated by placing a spirit-level across the top of the tires; no more than ⅛ in. in difference is allowed between them. If any difference exists, then the larger tire is always placed on the outside.

A tire preservative is applied to the side-walls of all our tires; we believe that this practice helps to protect the tire against the effects of heat, rain, cold, etc.

We have one rule which we think has done more than any other in helping to stretch the life of our tires; that is the one of overloading. We do not permit an overload under *any* circumstances. Each vehicle has its rated load, and we never allow this figure to be exceeded.

Our preventive maintenance program requires every vehicle to be spot-checked once a week for any minor adjustments or repairs that may be needed. Every driver fills out a daily report listing any

(*Please turn to page* 58)

SERVICE INSPECTION REPORT

NAME ____ Last Inspected Date ____ Odometer ____ Truck No. ____

ADDRESS ____ Last Overhauled Date ____ Odometer ____ Odometer ____

	O.K.	ADJUSTED	REMARKS
1. Motor Supports — Oil Pan			
2. Cylinder Head Bolts — Gasket			
3. Fan — Belt			
4. Water Pump			
5. Manifolds — Bolts			
6. Oil Filter — Lines			
7. Generator — Charging Rate			
8. Starter — Drive			
9. Plugs — Wiring			
10. Distributor — Timing			
11. Carburetor — Float Level			
12. Air Cleaner — Governor			
13. Tank — Lines — Strainer			
14. Fuel Pump — Pressure			
15. Oil Pressure			
16. Muffler — Exhaust Line			
17. Oil Leaks — Noises			
18. Radiator — Connections			
19. Thermostats			
20. Front King Pins — Bushings			
21. Tie Rod			
22. Steering Rod			
23. Steering Arms — Lever			
24. Steering Housing — Pitt — Wheel			
25. Wheel Alignment			
26. Front Springs — Clips — Shackles			
27. Rear Springs — Clips — Shackles			
28. Front Wheels — Rims — Bearings			
29. Rear Wheels — Rims — Bearings			
30. Wheel Lubrication			

	O.K.	ADJUSTED	REMARKS
31. Front Brakes — Lining — Drums			
32. Front Brake — Adjustments			
33. Front Brake Connections — Lines			
34. Rear Brakes — Lining — Drums			
35. Rear Brake — Adjustments			
36. Rear Brake — Connections — Lines			
37. Brake Cylinders — Wheel — Master			
38. Emergency			
39. Transmission — Mounting			
40. Lubricant — Noises — Leaks			
41. Gear Shift			
42. Clutch Housing — Pedal			
43. Clearance — Noise — Action			
44. Universal Joints — Bolts — Lubricant			
45. Drive Shaft Bearings			
46. Torque Tube			
47. Rear Axle Exterior			
48. Gear and Bearing Adjustments			
49. Noises — Lubricants			
50. Battery — Cables — Carrier			
51. Frame — Brackets			
52. Bumpers — Front — Rear			
53. Lights — Signals			
54. Wiper — Mirror			
55. Speedometer — Ammeter			
56. Gasoline Gauge			
57. Tools — Equipment			
58. Body Exterior — Roof — Windows			
59. Body Interior — Hardware			
60.			

TIRES	O.K.	PERMIT OR DEPOSIT	SERIAL NUMBER
R. F.			
L. F.			
I. R. O.			
I. R. I.			
T. R. O.			
T. R. I.			
SPARE			

COMPRESSION TEST

CYL.	Before	After	CYL.	Before	After
1			4		
2			5		
3			6		

GALLON TESTER

IDLE ____ MIN. ____ MAX. ____ MILES ____

VACUUM GAUGE TEST

Starter Only ____
Idle ____
Intermediate ____
High ____

EXHAUST GAS ANALYSIS

IDLE — Before ____ After ____
HIGH — Before ____ After ____

ROAD TEST

1. Engine Power and Acceleration OK
2. Clutch and Gear Shifting Mechanism is OK
3. Steering Mechanism is OK
4. Service and Emergency Brakes OK
5. All Lights are Working OK
6. Governor Functioning at ____ M.P.H.
7. Other Units are in good running condition

Checked By ____

THIS SHEET MUST BE FILLED IN DURING INSPECTION, NOT AFTERWARD Date Started ____ Date Finished ____ Inspected By ____

THOROUGHLY CLEAN ASSEMBLY, CAREFULLY INSPECT EACH FASTENING, ADJUSTMENT, CLIP, RIVET, BOLT, NUT AND COTTER BEFORE CHECKING UNIT O.K.

Form 184

THIS is the monthly Service Inspection Report form, used for preventive maintenance.

trouble he has had with his vehicle, and any suggested repairs that he feels are necessary. The shop then checks the vehicle against this report and makes any necessary adjustments or repairs that might be needed.

A complete preventive maintenance check is performed once a month on all city delivery trucks and every 5,000 miles on our over-the-road vehicles. This check includes every unit on the vehicle, besides a compression and vacuum-gage test of the engine.

All vehicles are given a monthly tune-up which consists of checking spark plugs, distributor, timing, carburetor float-level and all electrical wiring.

A complete overhaul is performed on our over-the-road vehicles once a year. City delivery trucks are overhauled whenever necessary. The mileage travelled by these trucks is small in comparison to the transport vehicles, and therefore they do not require an overhaul on an annual basis.

Lubrication is done every 1,000 miles on our over-the-road trucks; city delivery trucks are lubricated once a month, regardless of mileage.

We do not change crankcase oil on a mileage basis; it is changed only on a seasonal basis. We do not believe that oil ever wears out; it only becomes contaminated by dirt, etc.; and if good filters are installed and kept in a clean condition, the oil need never be changed. We change the filter cartridges on all trucks at the first indication of dirty oil. We average about 460 miles to the quart of oil. Rings are now lasting about 70,000 miles. . . . Grease in the rear and transmission is changed seasonally.

Brake lining is lasting about 40,000 miles on our over-the-road vehicles and about 20,000 miles on city delivery trucks, which of course, make more stops in a day than the transport vehicles.

Connecting-rod bearings used to give us from 50,000 to 75,000 miles. The current wartime bearings are averaging only about 18,000 miles before failure.

Once a year each vehicle is sanded down and the old varnish is removed; then a new coat of varnish is applied. This costs us about $40 for our transport trucks and $30 for our local trucks.

As an added feature of safety, our garage staff has constructed a tire-inflation box, which we use to inflate

(*Please turn to page* 102)

	MAKE	SIZE	SERIAL No.
TIRE DATA RF			
LF			
RRI			
RRC			
LRI			
LRO			
S			

COMP. TEST	Cyl No.	BEFORE	AFTER	Cyl No.	BEFORE	AFTER
Hot Motor	1			5		
	2			6		
	3			7		
	4			8		

VACUUM GAUGE			
	Manifold Leaks (Starter only)		
	Idle Speed		
	Intermediate Speed		
	High Speed		

1/10 GALLON TESTER: Idle — Minutes ____ Road — Miles ____

EXHAUST GAS ANALYSIS: Idle — Before ____ After ____ High — Before ____ After ____

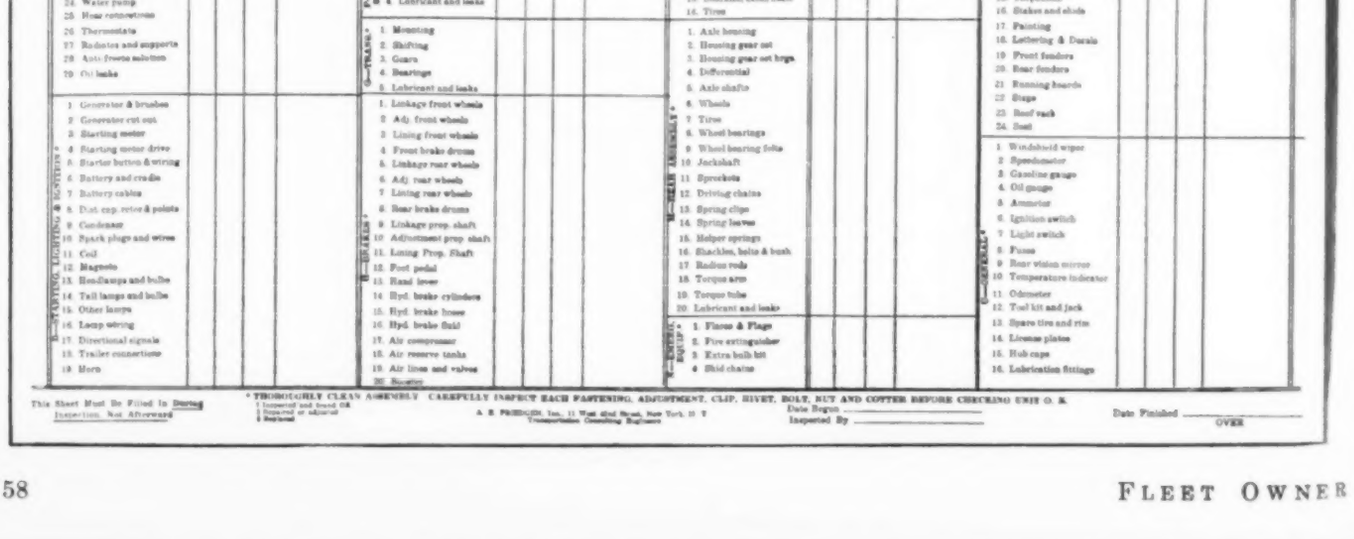
ROAD TEST	Checked by
1 Engine power and acceleration O.K.	
2 Clutch and gear shifting mechanism is O.K.	
3 Steering mechanism is O.K.	
4 Service and Emerg. brakes O.K.	
5 All lights are working O.K.	
6 Governor functioning at M.P.H.	
7 Other units are in good running condition	

COMMENTS

Date ____

Signature ____

ABOVE is the reverse side of the big form shown below. The forms used in this fleet were devised by A. E. Friedgen, Inc., transportation engineers, New York, N. Y. . . . This very complete form is used in connection with major repairs. The text explains just when each of these forms is used and how.



REGULAR INSPECTION SHEET

Name ____ Address ____ Truck No. ____ Make ____ Odometer Reading ____ Routine Inspection or Overhaul ____

	†Insp.	†Rep.	§Repl.	REMARKS
A—ENGINE: 1. Crankcase; 2. Oil pan & gaskets; 3. Cylinders; 4. Cylinder head; 5. Main bearings; 6. Crankshaft; 7. Conn. rods & bearings; 8. Wrist pins; 9. Pistons; 10. Rings; 11. Camshaft; 12. Distributor shaft drive; 13. Valve seating; 14. Valve adjustment; 15. Carbon; 16. Cylinder head gasket; 17. Oil pump and screen; 18. Oil lines and gaskets; 19. Oil filter and cartridge; 20. Timing gears & chain; 21. Governor and seal; 22. Fan and drive; 23. Flywheel bolts & gear; 24. Water pump; 25. Hose connections; 26. Thermostats; 27. Radiator and supports; 28. Anti-freeze solution; 29. Oil leaks				
B—WIRING & LIGHTING: 1. Generator & brushes; 2. Generator cut out; 3. Starting motor; 4. Starting motor drive; 5. Starter button & wiring; 6. Battery and cradle; 7. Battery cables; 8. Dist. cap, rotor & points; 9. Condenser; 10. Spark plugs and wires; 11. Coil; 12. Magneto; 13. Headlamps and bulbs; 14. Tail lamps and bulbs; 15. Other lamps; 16. Lamp wiring; 17. Directional signals; 18. Trailer connections; 19. Horn				

	†Insp.	†Rep.	§Repl.	REMARKS
C—CLUTCH*: 1. Pedal adjustment; 2. Release bearing; 3. Disc facing; 4. Pressure plate				
D—FUEL SYSTEM*: 1. Tank and fastenings; 2. Gas lines; 3. Vacuum tank; 4. Fuel pump; 5. Strainer; 6. Carburetor and adj.; 7. Air cleaner; 8. Choke control; 9. Acceleration Pump; 10. Throttle controls				
†Exhaust System: 1. Manifold and gaskets; 2. Exh. pipe and muffler; 3. Carb. heat riser				
E—PROP SHAFT*: 1. Universal joints; 2. Flange bolts; 3. Center bearings; 4. Lubricant and leaks				
G—TRANS.*: 1. Mounting; 2. Shifting; 3. Gears; 4. Bearings; 5. Lubricant and leaks				
H—BRAKES*: 1. Linkage front wheels; 2. Adj. front wheels; 3. Lining front wheels; 4. Front brake drums; 5. Linkage rear wheels; 6. Adj. rear wheels; 7. Lining rear wheels; 8. Rear brake drums; 9. Linkage prop. shaft; 10. Adjustment prop. shaft; 11. Lining Prop. Shaft; 12. Foot pedal; 13. Hand lever; 14. Hyd. brake cylinders; 15. Hyd. brake hose; 16. Hyd. brake fluid; 17. Air compressor; 18. Air reserve tanks; 19. Air lines and valves; 20. Hicator				

	†Insp.	†Rep.	§Repl.	REMARKS
I—TRAILER COUPLING*: 1. Adj. and linkage; 2. Brake lining; 3. Brake drums; 4. Booster or diaphragm; 5. Lines, valves, controls; 6. Fifth wheel				
J—STEERING GEAR*: 1. Gear case; 2. Gear adjustment; 3. Steering wheel; 4. Drag link; 5. Lubricant				
K—FRONT ASSEMBLY*: 1. Front axle center; 2. Spindle bolts and bush.; 3. Wheels; 4. Wheel toe-in; 5. Wheel camber; 6. Axle caster; 7. Wheel bearings; 8. Wheel bearing felts; 9. Steering arms; 10. Tie rod connections; 11. Spring clips; 12. Spring leaves; 13. Shackles, bolts, bush.; 14. Tires				
L—REAR ASSEMBLY*: 1. Axle housing; 2. Housing gear set; 3. Housing gear set brgs.; 4. Differential; 5. Axle shafts; 6. Wheels; 7. Tires; 8. Wheel bearings; 9. Wheel bearing felts; 10. Jackshaft; 11. Sprockets; 12. Driving chains; 13. Spring clips; 14. Spring leaves; 15. Helper springs; 16. Shackles, bolts & bush.; 17. Radius rods; 18. Torque arm; 19. Torque tube; 20. Lubricant and leaks				
M—EMERG. EQUIP.*: 1. Flares & Flags; 2. Fire extinguisher; 3. Extra bulb kit; 4. Skid chains				

	†Insp.	†Rep.	§Repl.	REMARKS
F—FRAME*: 1. Side member; 2. Cross member; 3. Rivets; 4. Engine brackets; 5. Body brackets; 6. Shackle brackets; 7. Bumpers; 8. Other brackets				
B—BODY: 1. Sills; 2. Side panels; 3. Rear panels; 4. Rear tail gate; 5. Doors; 6. Mouldings; 7. Roof; 8. Cab; 9. Cowl; 10. Hood; 11. Hardware; 12. Windshield; 13. Window glass; 14. Curtains; 15. Tarpaulins; 16. Stakes and sheds; 17. Painting; 18. Lettering & Decals; 19. Front fenders; 20. Rear fenders; 21. Running boards; 22. Steps; 23. Roof rack; 24. Seat				
C—SPEEDO.*: 1. Windshield wiper; 2. Speedometer; 3. Gasoline gauge; 4. Oil gauge; 5. Ammeter; 6. Ignition switch; 7. Light switch; 8. Fuses; 9. Rear vision mirror; 10. Temperature indicator; 11. Odometer; 12. Tool kit and jack; 13. Spare tire and rim; 14. License plates; 15. Hub caps; 16. Lubrication fittings				

This Sheet Must Be Filled In During Inspection, Not Afterward

† Inspected and found OK
‡ Repaired or adjusted
§ Replaced

* THOROUGHLY CLEAN ASSEMBLY CAREFULLY INSPECT EACH FASTENING, ADJUSTMENT, CLIP, RIVET, BOLT, NUT AND COTTER BEFORE CHECKING UNIT O. K.

A. E. FRIEDGEN, Inc., 11 West 42nd Street, New York, N. Y. Transportation Consulting Engineers

Date Begun ____ Inspected By ____ Date Finished ____

OVER

WHAT DO FLEET OPERATORS WANT IN

POST-WAR TRUCKS?

•

By G. W. Laurie,

The Atlantic Refining Company, Philadelphia, Pa.

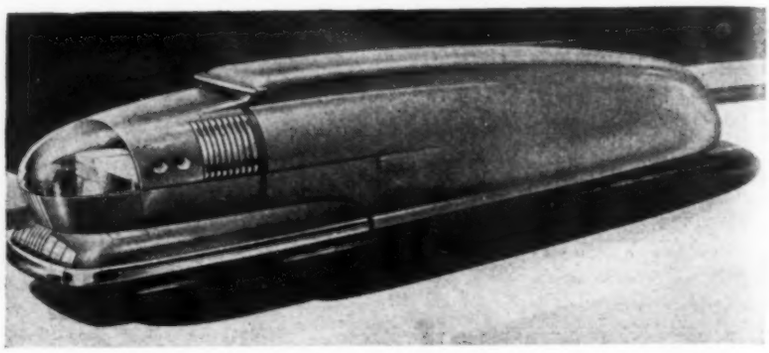
MOST fleet operators have their own definite ideas as to what constitutes the desirable and undesirable features of trucks as applied to their own operations. In gathering material for a paper on this subject (presented at the recent SAE Annual Meeting), it appeared that, to convey a message back to the manufacturers, as representative of the thoughts of fleet operators as a group, it would be highly desirable to canvass operators throughout the country, to obtain their views on this subject.

Towards this end, three different types of questionnaires were sent out to a total of 290 operators, represented as follows: 25 to Private Carriers (Special Group); 81 to Private Carriers; and 184 to Common, Contract and Local Cartage Operators. . . . The first group (marked "Special") received an individual letter indicating the general outline of the problem and they were asked to give their views on *"What Do Fleet Operators Want in Post-War Trucks?"*, without requiring them to answer any set questions. The response was practically 100 percent and the information quite complete. . . . The other groups listed were sent a typical questionnaire requiring in most instances a "yes" or "no" type of answer, with the provision to discuss any or all the questions, if they so desired. The response here was equally heartening, and the data gathered were used essentially to act as confirmation to the discussion which will follow. Here, briefly are the highlights of this survey's findings:

Cooling System: Considerable comment was given on this unit of the post-war truck. In summing up the remarks of operators on this question, there is a general agreement on the following: (1) Cooling systems, with all connections, should be more accessible, so that they can be readily checked and serviced. (2) The coolant operating level should be more clearly defined, perhaps by a readily-accessible pet-cock installed at the proper level. (3) Consideration to be given to some type of surge and expansion control, to overcome liquid loss from that source. (4) Better water-pumps with reduction in rust, corrosion and leakage. A packless type pump was mentioned in some of the reports. (5) Better thermostats in all trucks and consideration to by-pass systems, particularly in the larger units. (6) Provision for ease of cleaning cooling systems, with larger size drain facilities. (7) Under-hood temperature control, particularly along the lines for quicker warm-up.

Some suggestions that received individual mention for improving cooling system maintenance and operation were as follows: "Drain opening should be at least 1" in diameter and to be unobstructed". . . . "Expansion tank with water return". . . . "Reasonably even thermal distribution, without local hot-spots". . . . "Liquid cooling (with ethylene glycol) as is current practice in aircraft engines". . . . "Steam cooling". . . . "Heat-interchangers between engine oil and cooling liquid". . . . "Easily removable oil-pump screws". . . . "Sealed cooling systems". . . . "Depth gauge for water-level". . . . "Audible water-level and heat-indicator". . . . "Closed systems with high-pressure heat-exchangers

(*Please turn to page* 60)



HERE is Lurelle Guild's conception of the transport of the future. . . . Mr. Guild is a noted industrial designer and this is one of a series which he did for Timken-Detroit Axle Company. . . . Just a post-war possibility, of course.

and better plumbing". . . . "Thermostatically-controlled, variable-pitch fans."

Maintenance and Accessibility: Accessibility for maintenance shares the limelight in its unfavorable comments from operators in general. In appraising this question of accessibility, it becomes readily apparent that the starting point would be consideration to those items requiring frequent attention, some daily. Fuel, oil and coolant must be checked daily; therefore convenience for these operations is highly desirable. The cooling system has been covered above. The engine oil filler in many designs could be considerably improved by providing easy access to the oil-fill pipe, and the dipstick should be easily returned to position, as one operator comments, "without the use of flashlight or ladder." The fuel tank and fill opening, although accessible in most installations, receives its share of comment from two other directions: (a) Construction and strength. (b) Spillage of fuel during filling, due mainly to the inability of the tank to absorb the normal discharge rates of service station pumps.

The disadvantages of (b) are so apparent that no further comment is necessary. Under (a), practically all operators agree that the average fuel tank as supplied with the equipment needs to be fabricated better and use heavier material.

The matter of accessibility and maintenance of various items of the equipment in their order of importance depends to a large degree on the operation and the individual operating policy, so that the following discussion will not be classified in any attempt to adhere to such an order.

Electrical: The electrical system, including ignition, in many of the operations reporting, constitutes a large percentage of the maintenance effort, and ease of accessibility would be one of the major factors in improving the overall picture.

The battery should be located for ease of servicing, including checking and filling, removal and reinstallation, washing and/or cleaning exterior. The battery box or holder must be strong and well supported and the battery hold-down arrangement be more positive in holding the battery firmly in position. The chafing and short-circuiting of battery cables in most instances are traced to the battery's hopping around in the holder and wires not properly protected from sharp edges.

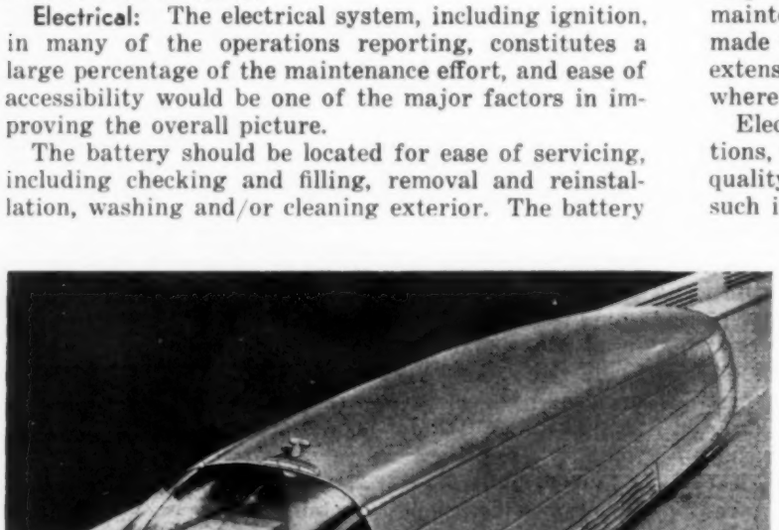
Spark plug maintenance in many models is quite simple; in others, it becomes a major undertaking. For example, one operator reports that it takes three-quarters to one hour to remove No. 1 plug in a certain make truck; whereas another operator indicated that on a certain group of trucks in his fleet it is practically impossible to remove No. 6 plug without special tools and a contortionist mechanic. In general, with the exceptions cited, we find that plugs would be accessible if they were not surrounded by hose, brackets and miscellaneous accessories.

Distributors usually are on some type of periodic inspection and adjustment plan in most preventive maintenance programs, and a pertinent suggestion was made to bring this unit *higher* in some units by some extension drive for ease of maintenance, particularly where the distributor is located in a low position.

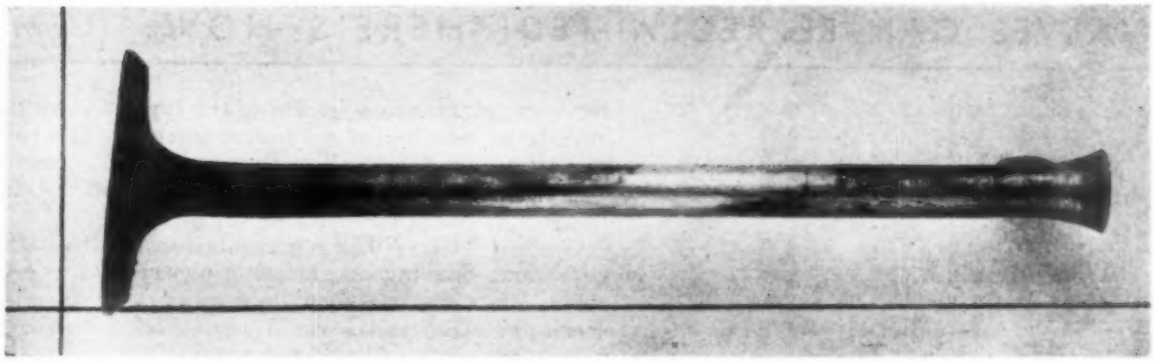
Electrical circuits and wiring, with but few exceptions, were condemned by operators because of inferior quality and lack of accessibility. The subject is of such importance that it cannot be dismissed lightly by simply stating that it must be improved. It is one of the modern mysteries of our times why the workmanship of automotive wiring, together with poor quality of wires, switches, connectors, fuse-blocks or lack of adequate fuses, is such as we find, when we consider the slight extra cost for the best and the fact that wiring installations are presumed to be installed for the life of the truck.

It only takes one quick glance behind the instrument-panel to see the conglomeration of inter-twined wires with open connectors, for proof of our statement concerning haphazard workmanship and design. When it becomes necessary to rewire the cab wiring, then, gentlemen, you have an expensive, long and tedious job in front of you. Before being asked why it is necessary to rewire, the question can be answered simply by stating that where the wire insulation has not become brittle from the heat generated

(*Please turn to page* 108)



AND here is another in the series of post-war designs by Lurelle Guild.



A warped valve, otherwise reclaimable. . . . This article gives some pointers on how to reclaim bad valves of all kinds.

HOW *to* RECLAIM ENGINE VALVES

By Norman Hoertz,

Service Engineer, Thompson Products, Inc., Cleveland, Ohio.

THE possibility of reclaiming old automotive engine valves has been looked into by the SAE Ordnance Vehicle Maintenance Committee and this article is the result of their findings. It discusses all ways and means of repairing valves. Much of the test work is still in progress and it is not possible at this time to draw definite conclusions in all cases. However, it is felt that this endeavor will provide a few new ideas that may aid many fleet operators who are in distress due to lack of valves.

Upon starting the committee work, the idea of repairing valves was discussed with many garage men, fleet operators and valve manufacturers. The variety of answers was as numerous as the number of men contacted. The consensus of opinion (of both the garage men and fleet operators) was that they prefer to limit their valve reclaiming to regrinding the seat and stem tip. (Pre-war practice had been to repair only the seat and stem tip.) Valves found with cracked heads, deep pits, burned areas, or seats ground to a knife-edge on the circumference, were always thrown away, with no thought of reclaiming them. This was the logical thing to do, since in normal times a new replacement valve was readily obtainable at a cost much lower than any form of repaired part.

Today, however, the valve manufacturing industry, like many other industries which require high alloy steels, has felt the pinch of material shortages and alloy use limitations.

In many cases the lack of replacement valves has forced fleet operators to use their own ingenuity to repair valves by hard-facing, welding or other methods, in order to keep their equipment rolling. These emergency repairs have developed to a point where it was felt that the good points of all repair methods, if properly gathered, might serve as a valuable contribution to our transportation system.

With this thought in mind we started our committee work. We realize, and we want you to bear in mind in thinking of reclaiming valves, that the original pre-war valve, made from the best steels known to the industry, sometimes gave unsatisfactory service, due to a number of operating factors; so, if we attempt a repair by welding, we are very apt to get a part that is of lesser quality than the original.

It is not our desire to try to put garages in the valve reclaiming business. It is our sincere hope to present engineered methods for repairing valves, so that people attempting this job will have a plan to follow and end up with a part that will be reasonably satisfactory.

We knew, right from the start, that a repaired valve would cost much more than a new one, in fact, in some cases three to four times the amount, depending upon the extent and type of repair required. We have completely disregarded the cost feature in our work. We feel that the user of the valve can best make the decision on valve repair by comparing the urgency with the cost. This applies to both military and civilian use.

To have some basis for starting our program, a quantity of 600 valves was gathered from the scrap barrels of garages, fleet operators, and car dealers' service stations. They were gathered at random, so we would have a collection that would

(*Please turn to page* 62)

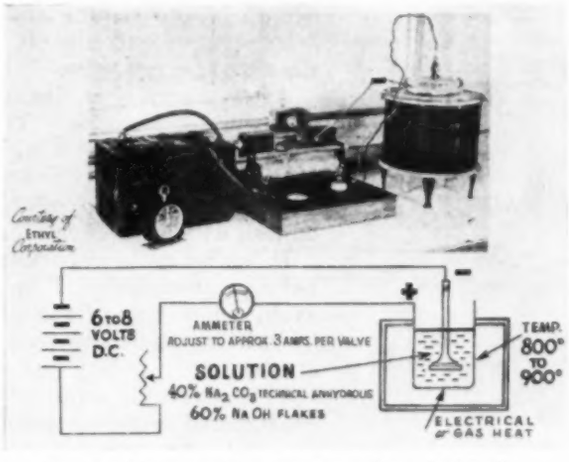


Fig. 1—Apparatus for cleaning valves electrically.

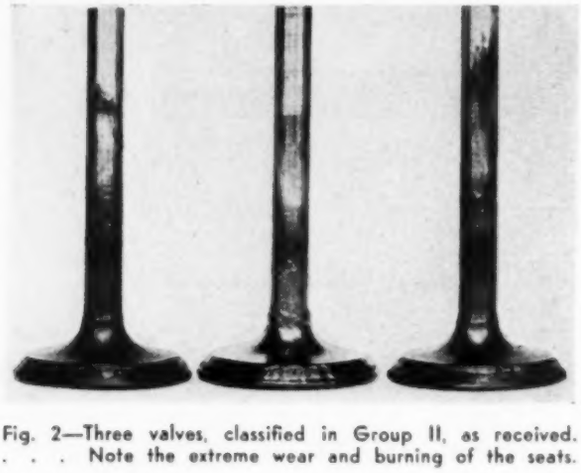


Fig. 2—Three valves, classified in Group II, as received. . . . Note the extreme wear and burning of the seats.

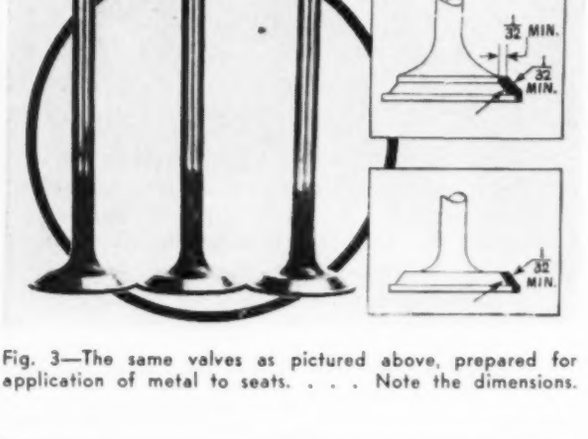


Fig. 3—The same valves as pictured above, prepared for application of metal to seats. . . . Note the dimensions.

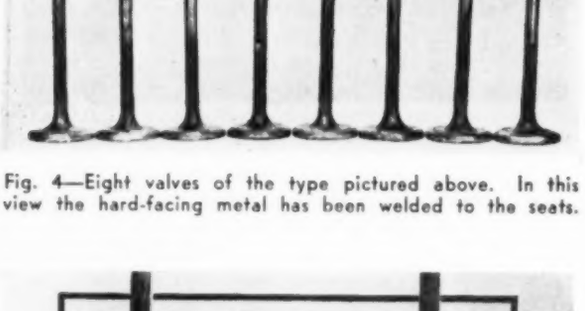


Fig. 4—Eight valves of the type pictured above. In this view the hard-facing metal has been welded to the seats.

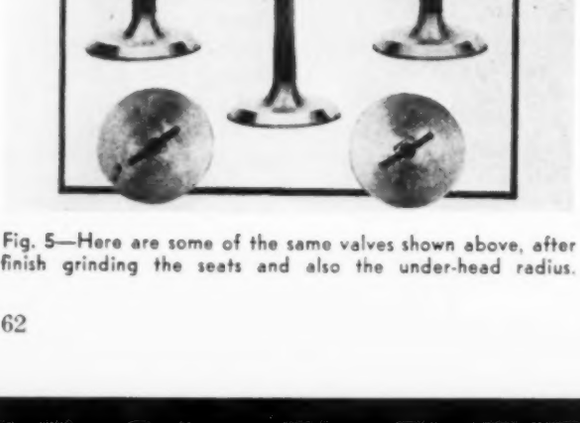


Fig. 5—Here are some of the same valves shown above, after finish grinding the seats and also the under-head radius.

represent a fair cross-section of the type of valve that would have to be repaired if we intend to relieve the valve shortage situation. Our collection was carefully examined and was classified into six groups, which we will call, for identification purposes, Groups I to VI, inclusive.

Group I: Group I is representative of valves which show no serious burning or guttering on the seat and no appreciable wear on the stem, lock-grooves or tip. Generally speaking, these valves can be put back into service after having the seats and tips reground. This group presents no particular problem, as they are universally repaired by regrinding the seats and tips on any number of valve refacing machines manufactured specifically for this purpose. Most of the machines have been on the market competitively for several years and all of them will do a satisfactory job.

Group II: In this group (see Figure 2) are valves which have the seats guttered, pounded or burned to a point where refacing will bring the outer diameter to a point where it will be too small to fit the seat. To repair valves in this group, metal of some kind must be added to the seat.

Group III: Group III are valves which have deeply burned areas, gutters or cracks. To repair them, the cracks and burned areas must be welded.

Group IV: Group IV represents valves with stems worn. Here again is a case where metal must be added to make them usable.

Group V: Group V represents valves needing repair to the retainer groove, or tip. This is also a welder's job.

Group VI: Group VI represents valves which are obviously damaged beyond repair. In actual practice, valves will fall in one or more of the above groups, but for convenience in our discussion, we will keep them isolated and determine the operations necessary to put each of them back into service.

Two operations common to all of the repairable groups are cleaning and inspection. Cleaning can best be accomplished by wire-brushing, grit-blasting or electrolytic cleaning. The electrolytic method of cleaning is very efficient and is probably the best method to use, particularly for operators who plan to do valve reclaiming on a large scale.

The electrolytic method consists of a small pot containing a solution composed of 40% NA_2 CO_3 technical anhydrous and 60% Na OH flakes heated to a temperature of 800 to 900 degrees F. The valve to be cleaned is immersed in the solution and connected to a six or eight-volt source of d. c. electric current.

The valve is connected to the negative side of the current source and the pot to the positive side. A rheostat is connected in the circuit and adjusted to pass approximately 3 amperes of current. It will take from 5 to 10 minutes to clean an average valve.

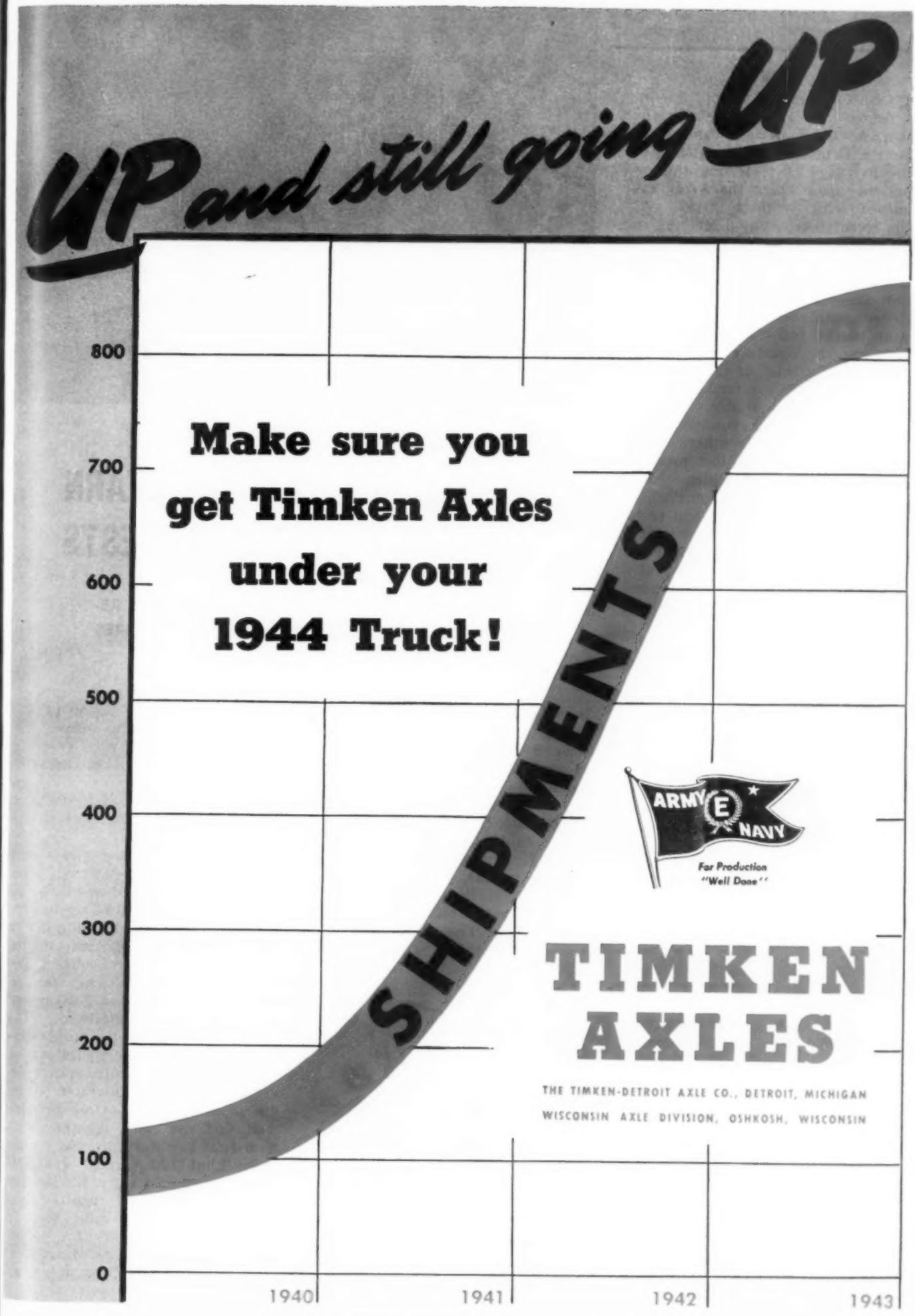
After the valve is cleaned, it should be quenched in water at room temperature. The quench is used to remove the coating of molten salt which would be very difficult to get rid of, if the valve cooled normally. *Extreme caution should be taken in cleaning valves by this method and face shields, as well as gloves, should be worn to avoid flesh burns.*

It is also quite important to have the valve absolutely dry before submerging it in the molten salt for cleaning, to avoid splattering of the solution. This can be accomplished by heating the valve to a point where all moisture will be evaporated.

The apparatus required (illustrated in Figure 1) can be constructed quite economically. The size of the pot can be determined by the number of valves to be cleaned at one

(*Please turn to page* 102)

UP and still going UP



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WHAT FLEET MEN MAY LEARN from ARMY SYNTHETIC TESTS

TANK-AUTOMOTIVE CENTER GIVES FLEETS RESULTS of ARMY TESTS with SYNTHETIC TIRES

FLEET operators should be indebted to the Development Branch, U. S. Army Tank-Automotive Center, Detroit, Mich., for the privilege of reviewing the experience data which the Army has gained with synthetic tires. At the recent SAE Annual Meeting in Detroit, the results of such experience were comprehensively outlined in a paper presented by Lt. Col. B. J. Lemon and Capt. J. J. Robson, abstracts from which appear in the following paragraphs. Through the courtesy of Lt. Col. J. M. Colby, Chief of the Development Branch, this information has thus been made available to all.

The discussion was confined principally to the one synthetic rubber at present in greatest production, namely, "GR-S", which means "Government Rubber-Styrene". The Army's tire development and testing program, using this material, was initiated to save natural rubber and to convert to synthetic rubber as fast as the latter became available, maintaining adequate milltary requirements in both the natural and synthetic products.

A program was drawn up authorizing four major rubber companies to produce several hundred thousand synthetic tires, to be built with from 80 to 100 per cent synthetic in the treads and side-walls but with natural rubber carcasses, for unrestricted service by the Army in the United States. Comprehensive laboratory test programs were prepared, as well as Army-controlled highway and cross-country tests, and uncontrolled Army field service tests, in order to get conclusive factual data and experience as to synthetic tire performance and durability. Tire testing units, of course, were inaugurated in various sections of the country, including Canada and Alaska, and these tire testing operations are believed to be the most extensive of their kind ever attempted anywhere.

Army tires have a "mud and snow" tread pattern, designed to give good traction in soft going with reasonable wear on pavement. This differs from "highway" type tires, which are primarilly designed for maximum wear, with traction secondary. Ordnance tires are roughly divided into three groups, viz., Small, Medium and Large tires. The small group includes 6.00 through 7.00 (8-ply) for passenger-cars and light trucks. The medium group includes 7.00 (10-ply) through 10.00 for ¾-ton through 6-ton trucks. The large group comprises 11.00 through 14.00; also large earth-mover tires, for large trucks, tank-transporters, etc. Synthetic rubber has presented increasingly difficult problems in each of these groups, and separate consideration is here given to each group to avoid confusion.

Small Tires: The small tire group is largely devoted to the 6.00-16 tires used for the ¼-ton, 4 x 4 truck, known as the Jeep. The first tests run were with synthetic treads on natural rubber carcasses, which showed such promising results that tests were then conducted on 100 percent synthetic tread and carcass construction.

THE Army's synthetic tire tests covered virtually all tire sizes, from the little jeep's to the big earth-movers shown here.

The first of these tires were tested at Camp Seeley, operating at 50 mph, sustained speed, at atmospheric temperatures up to 115° F. These were run 10,000 miles on the standard course, then shifted to a 40 percent gravel course. The tires showed few failures after 13,000 to 15,000 miles—a good record for such severe conditions. The 100 percent synthetic tires were tested at Normoyle, operating on the highway at 55 mph and on severe cross-country surfaces at reduced speeds. These tires did very well, and the tests, together with numerous re-checks, proved conclusively that 100 percent synthetic tires are successful in the smaller sizes. Another test required that the tires run 5,000 miles without heat failure. Twenty-four companies supplying this size tire have passed this test, with most groups

(*Please turn to page* 114

"WHAT! HARD RIDING ON SMOOTH ROADS?"

• Mister, you may not believe it is possible, but trucks and buses equipped with *ordinary* shock absorbers often have just that trouble. Because ordinary shock absorbers are in *constant tension*. This tension stiffens the action of the vehicle's springs, and actually causes hard riding on smooth roadways.

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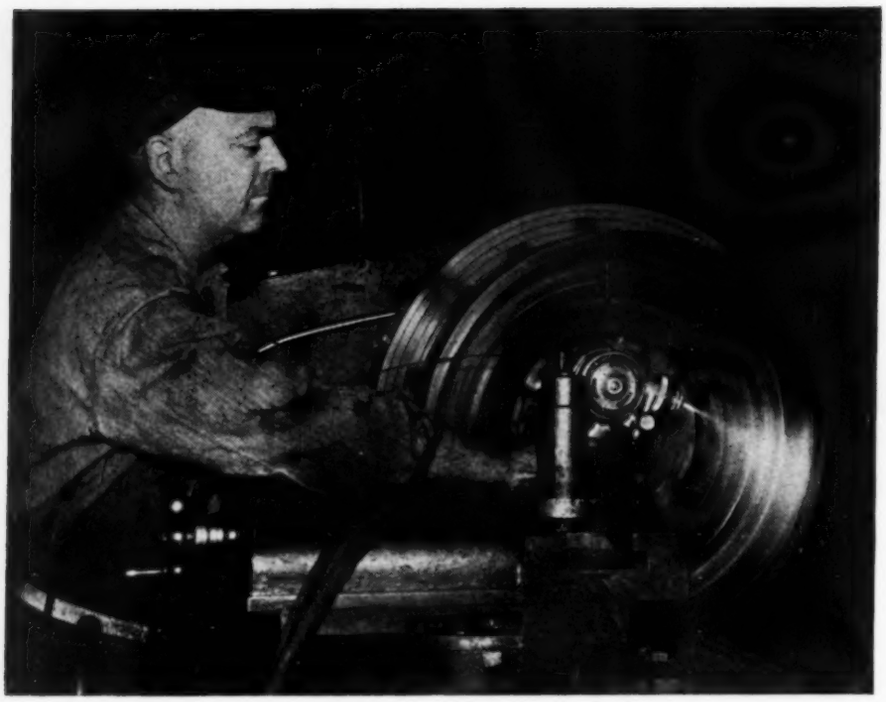

SAE LOOKS INTO METHODS OF BRAKE DRUM RECONDITIONING

PROGRESS REPORT OF MAINTENANCE COMMITTEE RECOMMENDS METAL-SPRAYING AS BEST METHOD

A PROGRESS report of the SAE Ordnance Vehicle Maintenance Committee on parts Reclamation, Brake Drum Group, reveals some very interesting data in this regard. In their attempt to explore the various possible methods of reclaiming brake drums, the following methods were first discussed:

(1) Sleeving or relining drums, by pressing or bolting a new curved reliner into machined drums. This method had been tried many times in the past; in fact, one manufacturer of buses and trucks had used it for years on at least one model as standard equipment. This was in the old days of metal-to-metal brakes, when they replaced the metal shoe plate and the drum wearing sections at each reline. Past experience of some of the committee's members indicated that under present-day speed and overload service conditions, this method of reclamation is not practical.

(2) Centrifugally casting a new brake track into old drums. This method was declared impractical, due to the chilling effect of the mass of old drum as compared to the weight of new iron being poured to form the new brake track. This method, if successful, would have entailed considerable shipping time and expense in getting old drums to a foundry equipped to do centrifugal casting and their return to the user.

(3) Rebuilding by welding, both by gas and electric-arc were discussed and rejected by the committee.

(4) Sprayed metal reclaiming was being investigated by the ODT-SAE Committee, and it was decided that this method held greater promise of success than other methods considered.

The Metallizing Engineering Co., Inc., Long Island City, N. Y., agreed to cooperate in the preparation of brake drums for tests, and a number of detailed reports on test procedure and spraying methods are contained in the committee's progress report. Some of the most interesting data submitted included the following:

Two front brake drums for a large Twin-Coach bus were reconditioned by the metal-spray process, and were installed back on the bus. After 12,833 miles of service in New York City, the drums did not look too bad. One had many small heat checks and a number of score marks, one quite deep, and wear was .024" at the deepest part. The other drum showed slightly more heat checking less scoring, and much less wear. The service performance of these two drums was identical, there being no pull to either right or left, indicating that the apparent friction value of the two types of iron used (10 and 80 percent carbon iron, respectively) are approximately the same. After 20,467 miles of bus service, inspection showed both drums to be scored and they were removed from service. The friction blocks used in this test were designed to score badly, and their use was to determine if reclaimed drums are more resistant to scoring than virgin drums.

Drum No. 101 was tested on a brake dynamometer by Manhattan Rubber Division of Raybestos. This had been sprayed with carbon-free iron. Heat-checking developed early in the tests. A complete cycle of 700 test stops were made, even though there was rapid wear of the friction material and fire bands appeared after 291 test stops. There was one score line in the center of the brake track and many fine lines; considerable heat-checking developed.

Drum No. 102 which had been spray-coated the same as Drum No. 101, was treated before testing by painting the brake track with a solution of water, a wetting agent and colloidal graphite suspended in water. During the first part of the test, a higher surface pressure was needed to provide the proper deceleration, but after 290 test stops, the need for excessive pressure lessened and the friction value was about the same as in Drum No. 101. There were many fine lines noted but the heat-checking was not as bad as on Drum No. 101.

It is interesting to note the effect of the graphite, the initial effect of which was to lower the apparent friction value. The second effect was the improvement in the condi-

(*Please turn to page* 104)

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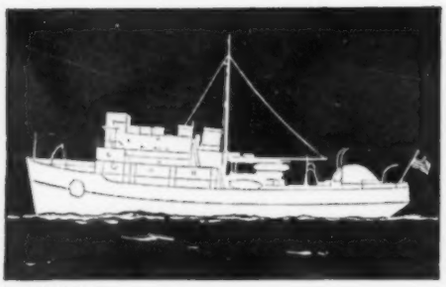

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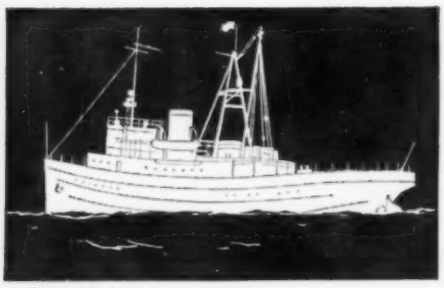

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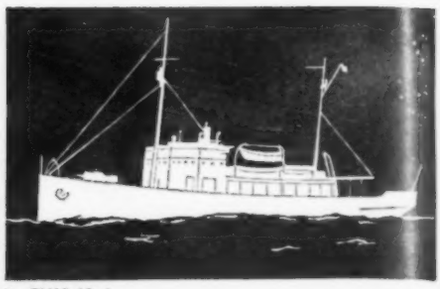

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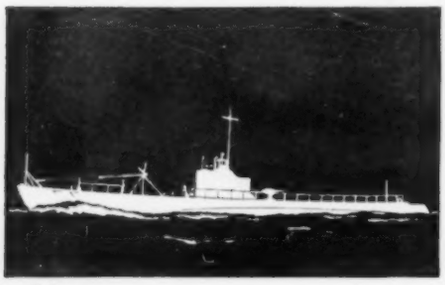

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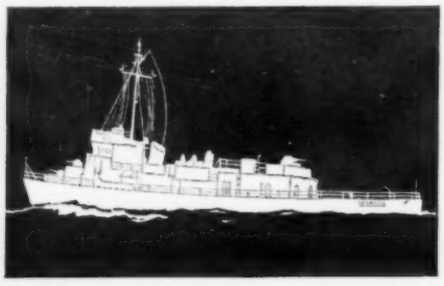

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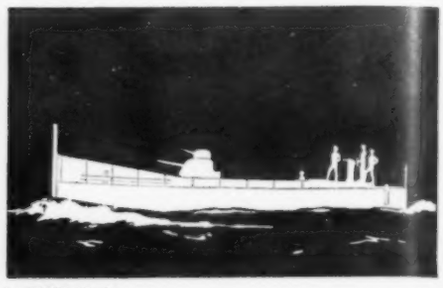

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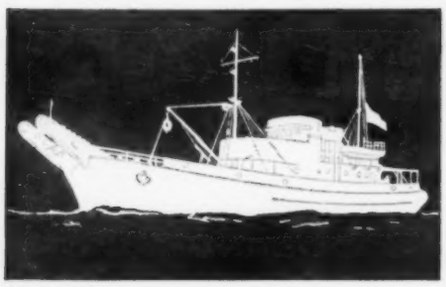

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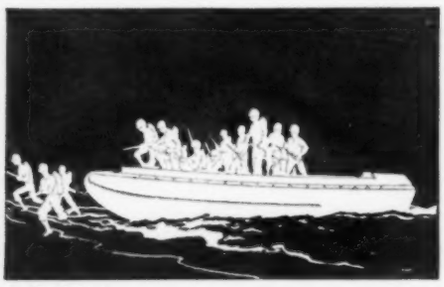

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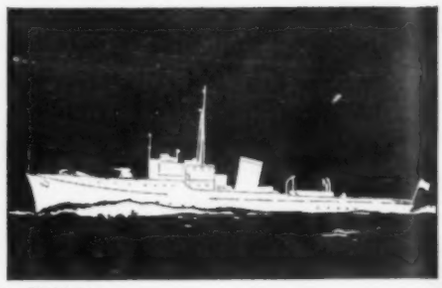

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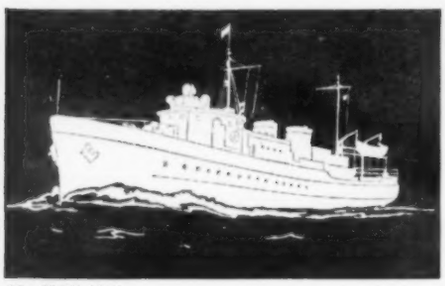

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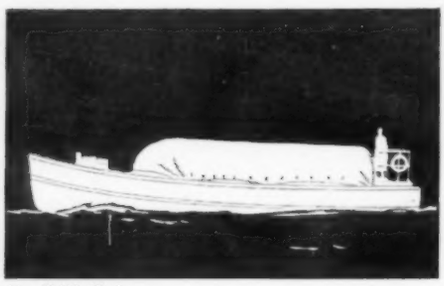

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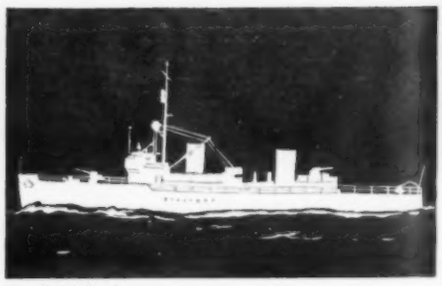

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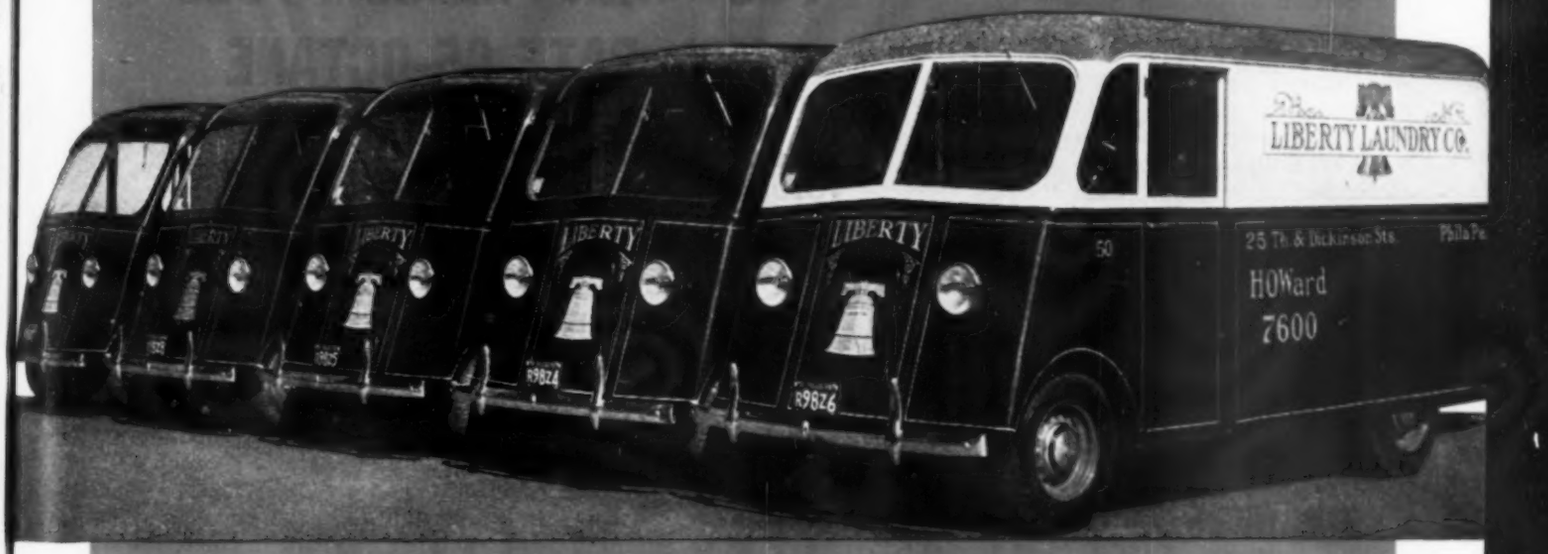

Operating a fleet of trucks in a big city like Philadelphia is no cinch, especially when each unit has to make 40 deliveries a day. But Anthony A. Tully, Fleet Superintendent for the Liberty Laundry Company, keeps things running smoothly because he insists on the best maintenance materials.

The fact, for instance, that Liberty trucks have to make a great many starts and stops —most of them in crowded areas—is a big problem when it comes to keeping brakes in shape. That's why Mr. Tully relies on dependable long-wearing Thermoid Brake Linings.

The Liberty fleet, in fact, is one hundred percent Thermoid-equipped. Mr. Tully reports that Thermoid linings give him 100% satisfaction, and that before using Thermoid, each truck required two brake relining jobs a year. Now only one is required.

No doubt about it, Thermoid Brake Linings *do* give an extra margin of safety and economy. They can help you keep *your* trucks where you want them—*on* the road and *out* of the shop. Try Thermoid on your toughest units—you'll find them RIGHT the first time, and every time.

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POST-WAR PREMIUM FUEL MAY RATE 85-OCTANE

100-OCTANE GAS MAY NOT BE AVAILABLE IN VOLUME — AND IT CAN'T BE EFFICIENTLY USED. POST-WAR CAR ALSO DISCUSSED at SAE MEETING

ALTOGETHER too many people seem to believe that just as soon as the war is over, the petroleum market will be flooded with gasolines of 100-octane and better. Just as the many rumors about super-streamlined, rear-engined, plastic cars have been sort of sidetracked for the time being, so has the post-war fuel question been dragged out into the limelight. At least, some enlightening thoughts on these subjects were presented at a recent meeting of the Metropolitan Section of the S.A.E.—and by men who *should* know.

The principal paper on motor fuels was offered by Bruce K. Brown, who holds the position of Assistant Deputy Petroleum Administrator for War. Collaborating in the preparation of this paper was D. P. Barnard, who has maintained an outstanding position as research engineer for the Standard Oil Company of Indiana for many years. A few of Mr. Brown's pertinent comments on the situation are presented in the following paragraphs:

"First," declared Mr. Brown, "100-octane fuels will *not* be available in sufficient quantities for use in passenger-cars when the war is over. The production of 100-octane gasoline must not be regarded as a procedure in which a stream of raw material is charged to a 100-octane gasoline plant from which the finished product emerges at the other end. As a matter of fact, this fuel is a rather complex mixture of highly specialized synthetic and carefully selected petroleum stocks.

"As catalytic cracking processes are operated to make aviation gasoline components, their production capacities and the yields of charging stocks are substantially less than would prevail if they were operating to maximum advantage in the manufacture of civilian motor fuel. In some instances, the operating costs, when operating for aviation purposes, are extraordinarily high and can be justified only by the emergency of war.

"The war program for making 100-octane aviation gasoline has required the resorting to every expedient to obtain maximum production from existing equipment and new equipment under construction, without regard either to ordinary refining economics or the extravagant use of crude.

"Some of these processes will in effect make 'gasoline out of gasoline' or, at best, out of high-quality virgin stocks almost as valuable as gasoline. Such operations will be required to compete with other processes which actually create gasoline out of much lower grade petroleum fractions.

"It, therefore, seems quite improbable that there will be any substantial early demand on the part of motorists for 100-octane gasoline. It may be that, some time long after the war, engineers will produce power plants which will operate effectively on 100-octane gasoline; but even so, for an appreciable number of years to come, the automobile's diet will be determined by the digestion of the older model cars and the pocketbooks of their owners.

"The United States is not going to run out of crude for many years yet to come, but it is fairly evident to all concerned that our national crude oil position is rapidly changing from one in which we are producers of excess crude, to one in which we will be required to import our marginal crude requirements.

"However, as the demand is reduced, the result definitely is *not* going to be that there will be a considerable excess of 100-octane gasoline available on a distress market. On the contrary, that part of the 100-octane gasoline which is not required, simply will not be produced.

"Catalytic cracked naphthas as produced for motor gasoline manufacture will, in general, tend to run 10 to 12 octane numbers higher than the materials which they will replace. This, therefore, indicates

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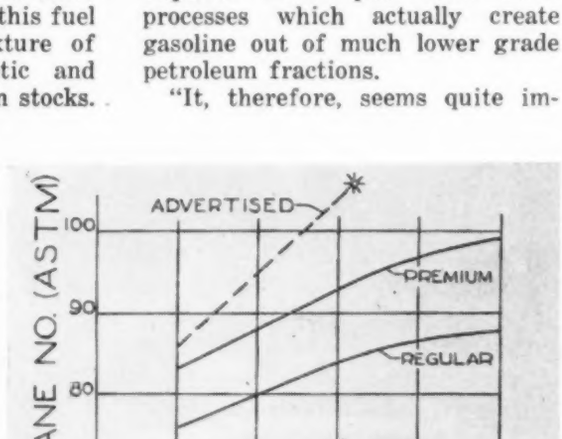

CHART shown by Charles A. Chayne, chief engineer of Buick, to illustrate his estimate of automobile fuel octane-ratings in the years after the war.

OVER the rolling pampas, crossing rugged mountain ranges, bridging rivers and slicing through impenetrable swamps and jungles, a great motor road has been carved to link North America with its good friends and neighbors to the south.

A 16,000 MILE PAN AMERICAN HIGHWAY WILL SOON BE COMPLETED, LINKING 18 LATIN AMERICAN COUNTRIES WITH THE U. S. A.

Only a few hundred miles yet remain to complete this great thoroughfare. Then, better than sixteen thousand miles of all-weather Pan American Highway will connect eighteen Latin American countries with the United States and Canada. Millions of dollars and thousands of men and motor trucks will have sweated this great roadway into reality.

The whole Western Hemisphere can take pride in this modern achievement. It represents a postwar force to unify the hopes and well-being of all the people of two continents. It ushers in a new era of opportunity and expansion to help solidify friendly cooperation and understanding between the nations and countries of these twin continents.

Contributing their share to this gigantic task, Federal Trucks have again proved their husky, heavy duty qualities—with hundreds of them employed as earth movers and supply units on many parts of the road work. Their fine performance records stand as a tribute to their dependable, low cost operation. To help solve *your* trucking problems—"Toss the Tough Jobs to Federal."

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POST-WAR DIESELS
WHAT WILL THEY BE?

•

JOHN DICKSON, CHIEF ENGINEER of GENERAL MOTORS DIESEL, EXPECTS TREND to be TOWARD MORE (AND SMALLER) DIESEL ENGINES

"The trend will be towards a multiplicity of engines, connected to a single drive-shaft." . . . Above is shown a typical example, a "twin" combination of two engines. . . . This has been used to power the M-4 and M-10 military tanks.

TWO TRENDS in design and application of automotive Diesel engines during the war, will accelerate Diesel engine use *after* the war, declared John Dickson, chief engineer in charge of development, Detroit Diesel Engine Division of General Motors, in his talk before the Pacific Logging Congress, held recently at Seattle, Wash. . . . First he cited the rapid trend toward the higher-speed engines; and second, the equally rapid trend toward use of smaller, so-called "high-speed" Diesels in *multiple* installations, in place of single, heavy, large slow-speed Diesels.

Sounding a warning against expectation of radical innovations in Diesel design immediately after the war, Mr. Dickson disclosed some wartime discoveries that may ultimately lead to an entirely new position in the power world for the Diesel type of engine. However, he foresaw immediately far wider application of Diesel in the post war period than in pre-war days, as a result of many war-proven developments.

"I am convinced," said Mr. Dickson, "that post-war power will comprise the very engines that have been produced and developed during the war; they will not be radical innovations suddenly thust on the users of the engines, as untried and undeveloped projects. Just as the ominous off-shore roar which warns Hitler that his hour of doom draws nigh, comes chiefly from the throaty throb of thousands upon thousands of Diesel engines, so will the same engines, tried and tested in the fire of battle, be the ones to lead in the post-war period.

"These engines are of the high-speed type, compared with the larger and slower speed engine with which industry was, in general, more familiar, prior to the war.

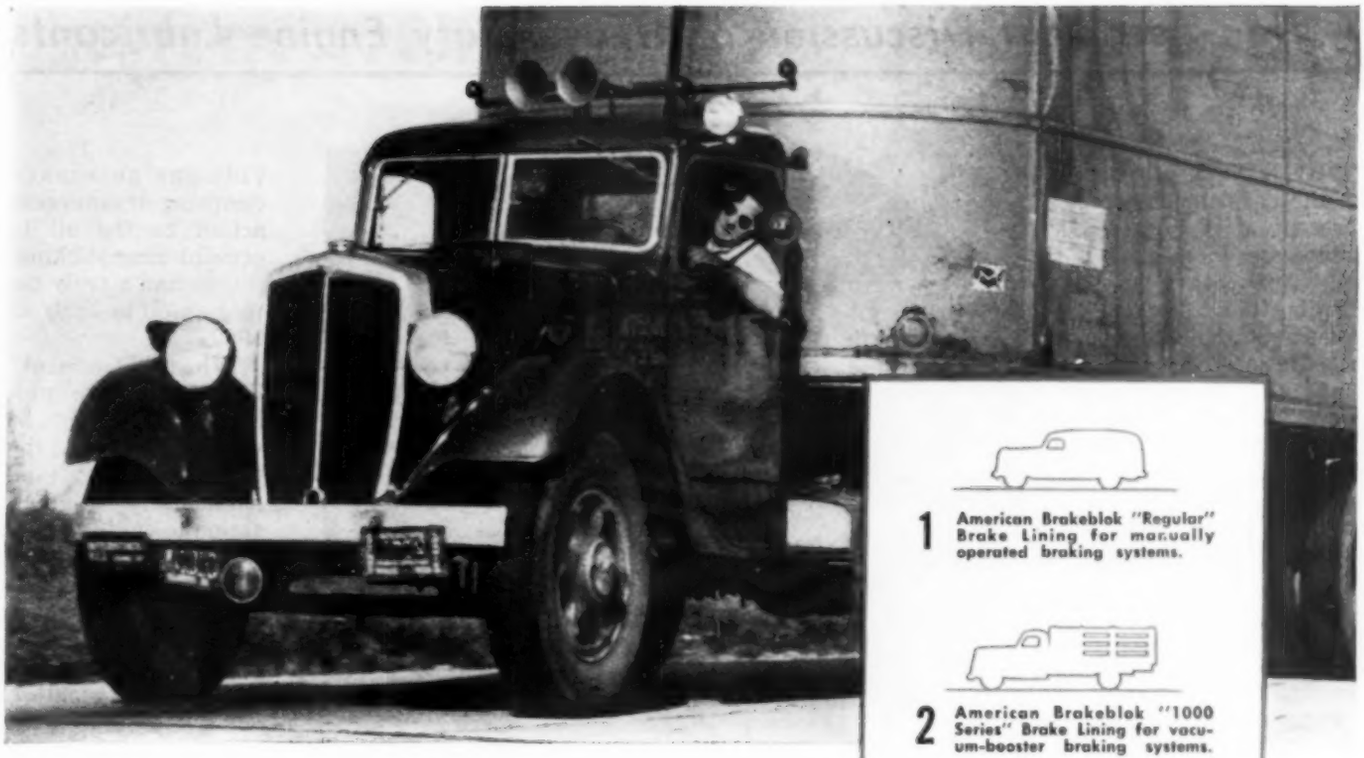
"Tremendous advances have been made in the production of Diesel engines. The demand has necessitated mass-production methods. This should make the cost of such engines relatively lower to the ultimate purchaser. It will enable the same unit engine to be used in a multiplication of applications. By this I do not mean that any one particular company or corporation will have a monopoly on the sale of engines, but that the user, for instance in the logging industry, will find it profitable to have in his tractors, scrapers, trucks, yarders and logging donkeys, the *same* engine adapted to meet the different applications.

"I am further convinced that the trend will be towards using a multiplicity of engines combined, in many cases, to a single drive shaft, to take the place of the large, single, slow-speed engine. This has been a very definite trend with our Armed Forces. For instance, in tanks and tank destroyers it has been possible to apply multiple Diesel engines in the space originally designed and allotted for use with the radial air-cooled, aircraft gasoline engine. The same can be said of the Navy in its amphibious landing craft program. Here we see the same engine being applied to small boats using a single engine, up to the large size in which a combination of eight of these same engines in sets of four with the same size and power, have been utilized as the means of propulsion. Each set of four engines serves one of the twin propellers.

Thus, I am convinced that the trend in post-war power will be definitely towards the same bore and stroke. This will enable the manufacturer to pass on to the user the advantages of mass-production, and at the same time will permit both the manufacturer and the user to benefit from the servicing and maintenance angle. Servicing parts should be relatively low in cost and readily obtainable—a factor which will reflect considerably on the ultimate earning power of the user's equipment.

"In the logging industry, where greater power is required for certain equipment than is afforded by the power of a single engine, twin engines connected to a single drive shaft will be available. Similarly, say, with the fishing industry. It can be visualized where all fishing boats, from the 20-footer up to the 150 foot tuna clipper, can utilize unit engines, singly or in multiple combinations. The failure of one engine would not necessitate the towing expense and weeks or months of delay which has occurred in the past while the engine is subjected to overhaul because, with a multiplicity of engines, the offending engine can be readily cut out as an operating unit relative to the others.

(*Please turn to page* 102)



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FACTS ABOUT MODERN DETERGENT-TYPE OILS

•

By E. J. Bowhay,

Technical and Research Division,
The Texas Company.

THE STORY behind the development of present-day, detergent-type lubricating oils for heavy-duty engines dates back to about the middle of the '30's. It was then that the Diesel engine, formerly used only as a large, low-speed engine for power-plant and marine service, began to expand as a smaller-sized, medium and high-speed power-plant for tractors, trucks and industrial applications. With the changes and improvements in mechanical design brought about by these new engines came lubrication difficulties to be overcome by the oil refiners with the cooperation of the engine manufacturers. Chief among these difficulties was ring sticking, piston and ring scuffing, wear and bearing failures.

It may be well to state at the outset that *not all* of these earlier difficulties were due to unsatisfactory lubricating oil performance, despite the tendency on the part of operators to blame the oil for every failure that occurred. Engine manufacturers appreciated this and their cooperation has been one of the contributing factors in the development of the superior, all-purpose, heavy duty, detergent-type oils adopted by the Armed Forces and available commercially today.

Early Development: One of the first of these manufacturers of modern high-speed Diesels to appreciate the part that mechanical design and operating temperatures played in these early failures involving lubrication was the Caterpillar Tractor Company. As a result of their development of a single-cylinder Diesel test engine, primarily to study piston ring sticking, the oil refiner was able to develop in his laboratory a heavy-duty engine oil which provided a marked improvement in the prevention of ring sticking, elimination of scuffing and reduction of engine wear. This oil, composed of a highly-refined straight mineral oil to which a chemical compound had been added, was the forerunner of today's detergent-type, heavy-duty oils. This chemical compound or additive employed was invariably of the "metallic soap type" to provide the necessary cleansing or detergent action to the oil to prevent ring sticking. So, we had a truly detergent oil as early as 1936.

What "Detergent" Means: Before proceeding it might be well to discuss the term "detergent" and particularly its application to engine lubricating oils. The dictionary defines the action of detergency as the cleansing or purging away of foul or offending matter. This is exactly what the chemical compound added to the straight mineral base oil did in preventing the piston rings from sticking in their grooves in the Caterpillar Diesel test engine.

During the combustion of fuel in a Diesel engine, deposits are formed consisting of gummy residues and soot. In addition, decomposition of the lubricating oil reaching the rings is also influenced by this combustion process. These gummy residues act as binders for the fuel soot and build up sticky deposits on the ring lands and in the ring grooves.

The additive in the lubricating oil enables the oil reaching these engine parts to take the deposits unto itself. This is accomplished partially by dissolving them but mostly by dispersing them in a finely divided state. This washing action of the lubricating oil on these potential deposit-forming bodies of fuel combustion is exerted as soon as the particles reach the oil. This same action occurs in other parts of the engine reached by combustion chamber products when blow-by occurs past the piston rings. These deposit-forming materials are partly dissolved and partly dispersed in a suspended state throughout the lubricating oil and thus are able to be carried out of the engine when the oil is drained. Thus the engine is kept clean by this detergent action of the lubricating oil.

Another characteristic of detergency in engine lubricating oils is the ability to remove previously-formed deposits from the surfaces of engine parts. This action is likened to that exerted by soap and water

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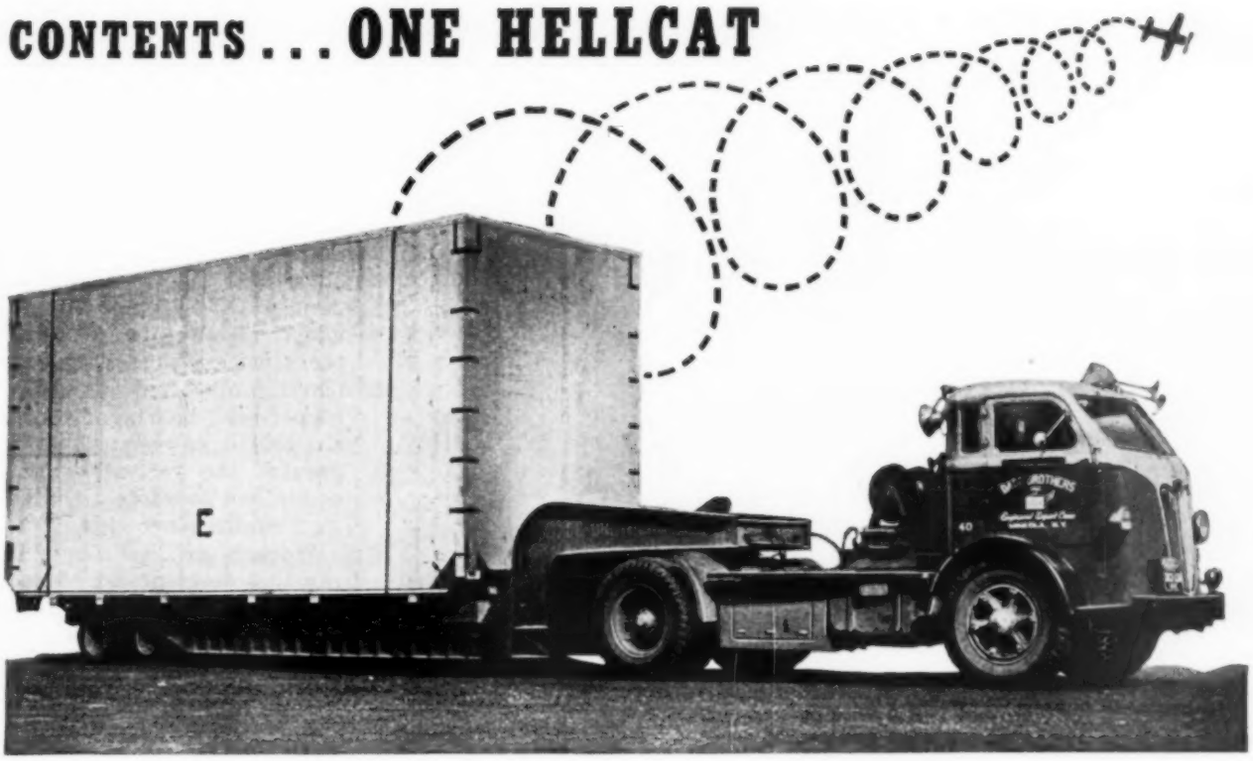
CONTENTS . . . ONE HELLCAT



The war has made some unusual demands of the trucking industry. Probably none was more spectacular than that requested of Dade Brothers, Inc., of Mineola, N. Y.

Imagine picking up your phone to find that Washington is calling and to hear a voice say, "We want you to crate Wildcats and Hellcats and deliver them to embarkation points."

Perhaps that's not exactly how it happened, but the fact is that Dade Brothers' packaging depots from Long Island to California are using a fleet of 65 trucks and tractors to haul huge crates, containing complete fighter planes.

"On the few occasions when these trucks need unusual service," writes Dade Brothers, "our drivers telephone the nearest Autocar Factory Branch and a trained mechanic is on the scene and has the truck running in no time. One of our Autocars, which is also used as a boom, lifts up to five tons. This piece of equipment works overtime. An Autocar Diesel Tractor in our fleet hauls as much as forty tons. Our drivers say it pulls away with ease."

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in cleansing dirty surfaces. These removed deposits are then broken up and dispersed in a finely-divided state throughout the body of the oil for removal from the engine at the oil-drain period.

Detergency, therefore, as related to engine oils, may be defined as that characteristic which prevents the initial deposition of products of fuel combustion and oil decomposition in new or clean engines. In used engines, detergency exerts a cleansing or dissolving action on old, previously-formed deposits, preventing their redeposition.

Oxidation Resistance: With the continuation of improvements in engine design permitting the development of more power for the same size and weight, new materials were necessary to withstand the higher stresses imposed. Chief among these was the copper-lead bearing which could stand heavier loads and higher temperatures than the ordinary babbitt bearing.

With the rapid adoption of this bearing for heavy-duty service in both gasoline and Diesel engines, it was discovered that under these more severe operating conditions ordinary motor oils were corrosive to this copper-lead mixture. This corrosiveness was brought about by the inability of this type of oil to resist oxidation, which results primarily from the action of heat and air. The resultant acidic bodies formed by this oxidation process attacked the lead in the copper-lead mixture, taking it into solution and leaving a porous copper structure which crumbled and broke away. Thus it became necessary to impart oxidation-resisting properties to the oil.

Improvement in oxidation-resistance of the straight mineral type engine oil, as determined by corrosiveness to the alloy type bearing, was attained by the use of chemical compounds or additives. These compounds were designated as oxidation inhibitors or corrosion inhibitors.

The corrosion inhibitors primarily afford a protection to the alloy type bearing so as to minimize the effect of acidic bodies on these bearings.

On the other hand, the oxidation inhibitors also provide a protection to this type of bearing by combating the formation of acidic bodies; this also results in a minimizing of varnish and lacquer deposits on piston skirts.

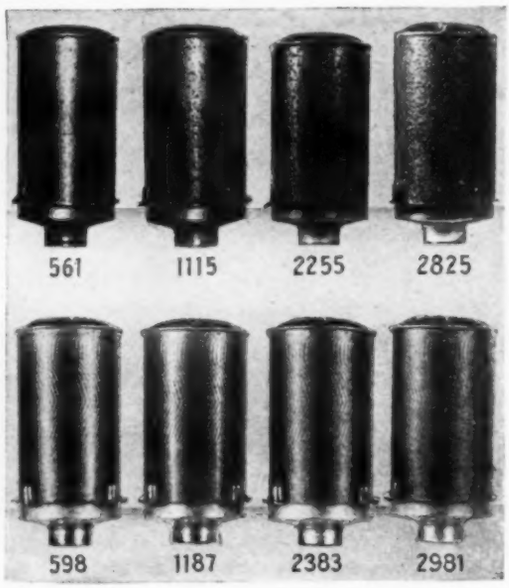

FIG. 1—Dispersion effect of lubricating oil on oil-strainers. . . . The figures represent miles. . . . The top line of elements shows effect of an oil with low dispersion characteristics. . . . The bottom line shows effect of an oil having high dispersion characteristics.

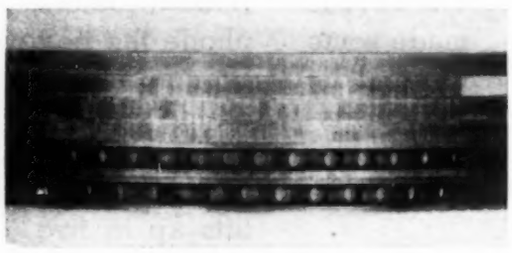

FIG. 2—Rings taken from engine subjected to an accelerated run-in and high-load test, showing results of using an oil having poor load-carrying capacity.

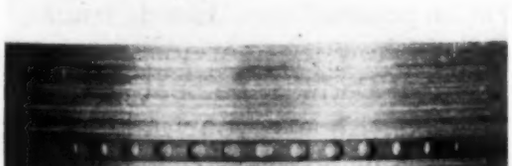

FIG. 3—Rings taken from an engine subjected to the same test. . . . By improving the extreme-pressure characteristics of the oil, "welding" was prevented.

The development of engine oils with high resistance to oxidation was furthered by the advent of the General Motors 2-cycle Diesel engine and its adoption to bus, truck and tractor service. This engine, employing oil-cooled pistons and copper-lead bearings, required an oxidation-resistant oil to prevent the formation of deposits and to protect the bearings against corrosion.

Property of Dispersion: During this development of an oxidation-resistant oil for Diesel engine service, another valuable characteristic of heavy-duty engine oils was discovered —that of dispersion.

The action of dispersion in a lubricating oil is of a physical nature in that the products of fuel combustion, chiefly soot, along with some oil decomposition products are held in suspension. This appears to be accomplished by the dispersing of these contaminating particles in a finely-divided state throughout the body of the oil. By this action, agglomeration of the particles is prevented, with the result that oil filters and strainers stay clean.

Although the phenomenon of detergency employs dispersion to a large extent, the two properties should be considered separately. This is readily appreciated when one considers that while all detergent oils known today have good dispersive properties, not all oils with high dispersion values display satisfactory detergency.

Dispersion, therefore, may be defined as that characteristic of an engine oil which enables finely-divided, insoluble particles resulting from fuel combustion and oil decomposition to be kept in a suspended state throughout the body of the oil. In an oil of poor dispersive qualities, agglomeration or precipitation of these products occurs to form noticeable engine deposits.

This property was found to be required to prevent the clogging of the metallic ribbon-type oil strainer placed between the oil pump and oil cooler on the General Motors Diesel. When this oil strainer element clogged with fuel soot sludge, the by-pass valve opened and the oil was by-passed around the oil cooler. This condition subjected the oil to still further oxida-

(*Please turn to page* 76)

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Keep essential transportation moving, without gaps in the line. Guarantee your country's future as well as your own. Keep brakes *up* and you won't let Uncle Sam *down*. Consult your jobber for Grey-Rock service. Consult your banker for War Bonds. UNITED STATES ASBESTOS DIVISION of Raybestos-Manhattan, Inc., MANHEIM, PA.

FIG. 4—Comparison of pistons from automotive Diesel engine after 500-hour tests. . . . Ordinary motor oil was used with piston at left. . . . Note clean condition of piston on right, which was used with detergent-type oil.

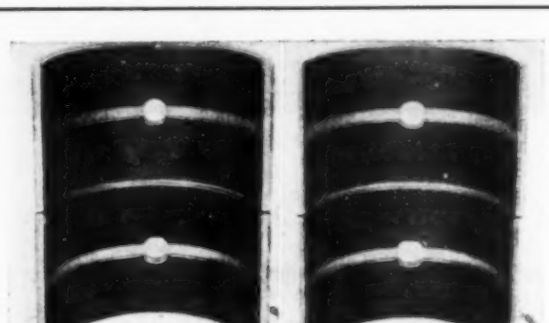


FIG. 5—Note satisfactory appearance of these copper-lead bearings from a 4-cyl. Diesel tractor engine after 1,040 hours of operation. . . . A detergent-type oil was used. . . . The tests were made in tractor field service.

tion as a result of the higher oil temperatures achieved and under-piston deposits, in addition to bearing corrosion, became a problem.

Base oils with inherently good dispersive properties, which were further enhanced by the use of oxidation-inhibiting additives of high dispersive characteristics, eliminated this condition by keeping blow-by products of fuel combustion in a finely-divided state throughout the body of the oil. This provided an oil with good oxidation-resistance and satisfactory dispersion but little or no detergency. Figure 1 shows the comparative effect of oils of high and low dispersion on the cleanliness of the oil strainer element used in the General Motors Diesel engine.

It was soon found, however, that this engine along with other makes of high-speed Diesels required detergency in the engine oil in addition to oxidation-inhibition and dispersion. Along about this time Caterpillar changed to the use of copper-lead bearings in certain model engines and the detergent-type oils not fortified against corrosion often permitted these bearings to fail. Thus it became imperative that an engine oil with properties of oxidation resistance, dispersion *and* detergency, should be developed.

Other well-known manufacturers of high-speed Diesel engines also recognized the need for an improved engine oil for heavy-duty service.

Overshadowing all of these demands by new and improved engines and engine materials was the never-ending desire of the oil refiners to improve their products through the ceaseless efforts of the research laboratory. Improvements in petroleum refining methods provided more stable and more highly oxidation-resistant base oils. Hand-in-hand with these advancements went research on additives for blending with these improved base oils, to provide the requisite properties already discussed. This culminated in the development of superior, all-purpose lubricating oils for Diesel, gasoline, butane and other types of internal-combustion engines.

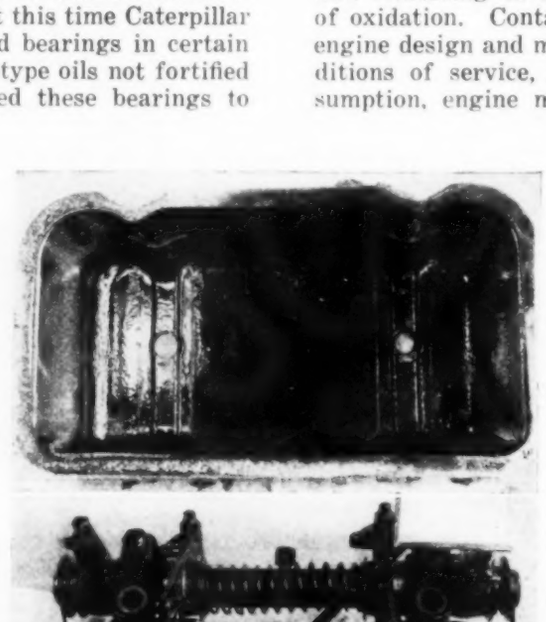


FIG. 6—Sludge-free condition of oil-pan and rocker-arms of 4-cylinder Diesel tractor engine after 2,759 hours on detergent-type oil in tractor field service.

Service Characteristics: As a result of extensive testing in the modern laboratories of oil refiners, as well as testing under actual field service conditions, certain characteristics about the performance of heavy-duty, detergent-type oils have been observed. These service characteristics are discussed briefly as follows:

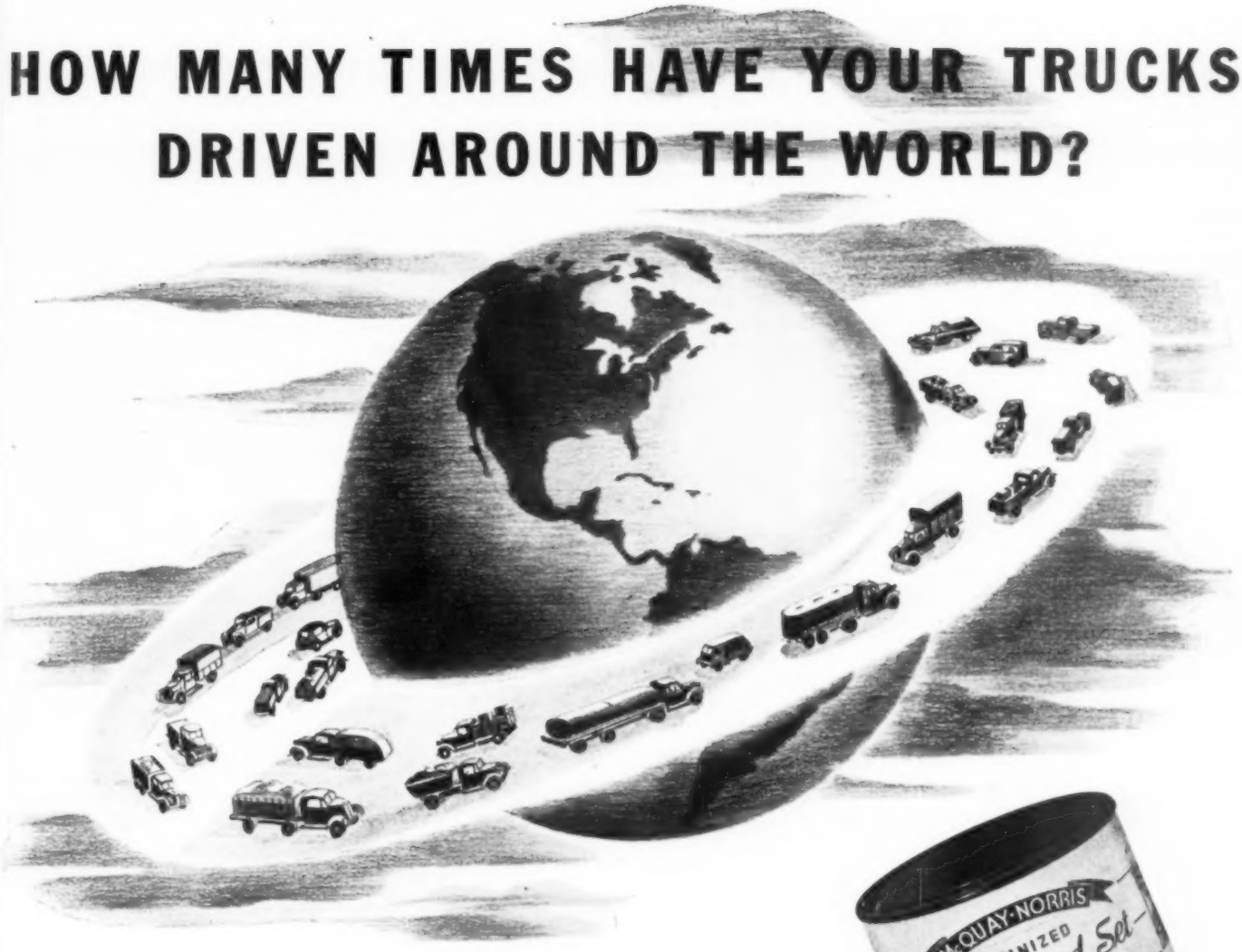
Oil-Drain Periods: The length of the oil-drain period is dependent primarily on the extent to which the oil is contaminated or decomposed while in service. This depreciation results generally from two major sources: (1) External to the lubricating oil system and including products of fuel combustion, dust, road dirt and wear particles. (2) Inherent in the lubricating oil and consisting of decomposition products as a result of oxidation. Contamination, as such, depends on the engine design and mechanical condition, operating conditions of service, quantity of oil required, oil consumption, engine maintenance, size and efficiency of oil filters and type and quality of oil.

Inasmuch as a heavy-duty oil with its detergent and dispersive properties is taking up more and more of these contaminants for removal when the oil is drained, there is a decided possibility that an overloaded condition will occur. When this happens some of the finely-dispersed contaminants may precipitate out of the oil, causing deposits on vulnerable engine parts. Accordingly the oil-drain periods for these oils should not be extended too long.

In general, the recommendations of the engine manufacturer should be followed in establishing an oil-drain period. Where such recommendations are not available, the engine operator and oil supplier should cooperate to

(*Please turn to page* 78)

HOW MANY TIMES HAVE YOUR TRUCKS DRIVEN AROUND THE WORLD?



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determine the oil-drain period based on engine appearance and used oil analyses.

Breaking-In New Engines: Many of the heavy-duty detergent oils are especially suitable for breaking in new engines. The high film-strength offers maximum protection against scuffing of the comparatively rough rubbing surfaces. Where manufacturer's recommendations for break-in are not available, new engines should be broken-in gradually up to approximately one-half load, using an oil one grade lighter than that recommended for normal service. A change to the heavier grade should then be made before full load is placed on the engine. Not only will this method give best protection to engine surfaces during the break-in period, but draining the oil in the middle of the break-in gives the engine a most desirable flushing.

Use in Dirty Engines: When installing heavy-duty detergent oils in engines which have been previously lubricated with an ordinary motor oil, a cleansing action will take place tending to remove any deposits formed by the previous oil. Overloading of the oil with these contaminants may occur rapidly and more frequent initial oil drains are required to guard against oil system clogging. If the engine is very dirty, the oil should be drained after the first few hours of operation. If the engine is fairly clean, the first oil drain should be at not more than ½ of the normal drain period.

Oil Consumption: Due to the cleansing action of these oils on piston ring, piston skirt and oil line deposits when first installed in an engine in poor mechanical condition, the oil pressure may drop slightly and oil consumption may increase. However, with the continued use of these oils the performance of the engine in these respects should gradually improve. Where such improvement does not occur, the engine should be given the needed overhaul indicated by the occurrence of these conditions.

Compatibility: Heavy-duty detergent oils meeting Army or Navy specifications are required to be compatible in any proportions. As a general rule, however, mixing of heavy-duty oils, particularly those not meeting the above specifications, should be avoided as much as possible. When planning to change to the use of a different oil, it is preferable to drain the oil system completely and then flush the engine before installing the new product.

Oil Darkens in Service: Filters and engine parts stay cleaner when the heavy-duty detergent oils are used but the oils themselves become darker. This darkening takes place rapidly due to the highly dispersive effect of the oil on any carbon present. Even a small amount of carbonaceous material is dispersed throughout the oil in a very finely-divided state.

Darkens Copper: Many of the heavy-duty detergent oils darken the copper in copper-lead bearings, copper and brass fittings and certain other non-ferrous metals exposed to the oil in engine crankcases. This is advantageous for two reasons:

1. The formation of a black protective plating on the surfaces of copper-lead bearings prevents additional chemical attack. The coating is of almost immeasurable thickness and long endurance tests under all sorts of service conditions have proved the merits under this method of bearing corrosion prevention.

FIG. 7—Comparison of oils of low and high dispersion by laboratory test. . . . The bottle on the left shows oil of low dispersion, while the bottle on the right shows oil of high dispersion characteristics.

2. By coating copper lines and brass fittings in the engines, the normally high catalytic effect of copper on oil oxidation and sludge formation is greatly reduced.

Rust Prevention: Certain of the heavy-duty detergent oils afford much greater protection to engine surfaces against rusting. These oils, therefore, are especially suitable lubricants for use in engines just prior to shipment or storage or for engines which are run intermittently or may remain idle for an extended length of time.

Effect of Water: When water is added to properly refined straight mineral oils, rather rapid separation of the two liquids occur. When added to the heavy-duty detergent oils, however, the water has somewhat less tendency to separate from the oil. This action is probably beneficial when only small quantities of water are involved, since it thereby contributes to the rust-preventive qualities of the oil. However, larger quantities of water such as may result from moisture condensation under extended periods of low-temperature operation and water leakage, may cause an emulsion to form. The presence of excessive water in any engine crankcase is always detrimental. It is especially so with the heavy-duty detergent oils due to this possibility of the formation of an emulsion.

Mechanical Lubricators: Some difficulty may be encountered in the feeding of heavy-duty detergent oils through the usual sight-glass liquids of mechanical lubricators used to supply oil to the cylinders of large stationary Diesel engines. Cloudiness of the liquid and inability to control the size and rate of droplet formation may occur. Pure distilled water has been found more satisfactory than glycerine for use with heavy-duty detergent oils. Ordinarily these lubricators are made of brass or other non-rusting materials, but where iron is used, small amounts of rust preventives can be satisfactorily added to the water where necessary. Freezing of the water can be counteracted by the addition of ethyl alcohol up to 25%, but usually engines equipped with these lubricators are not installed in exposed locations.

Foaming: Originally, some of the heavy-duty detergent oils had a greater tendency to foam than straight mineral oils. This condition has since been generally corrected. It has been found that the tendency to foam is reduced if the oil is kept free from water and also, that the foaming tendency subsides after the oil has been in service.

Air Cleaners: It has been found that under certain conditions some of the heavy-duty detergent oils have a greater tendency to foam in oil-bath air cleaners than straight mineral oils. In most cases, however, these oils can be satisfactorily used in air cleaners of this type provided the oil is maintained at the recommended level in the oil cup.

Oil Filters: Most types of oil filters are satisfactory for use with the heavy-duty detergent oils. Although it has been found that absorbent or clay type filters, such as those containing Fuller's earth, remove the additives from some of these oils, many of the more recently marketed oils can be used satisfactorily with this type of filter with only slight additive removal. In some operations certain makes of edge type filters composed of paper discs tend to clog rapidly when used with these oils. On the whole, however, oil filters stay cleaner for longer periods, due ap-

(*Please turn to page* 126)

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AN apparent "mechanical failure" accident. . . . It is said that the brakes on this combination "refused to operate" as the vehicle approached a rail crossing, with a train a short distance away. The driver speeded up and saved his own life, but the engine hit the trailer, with the results shown.

MORE I.C.C. ACCIDENT REPORTS DUE *to* MECHANICAL FAILURES

IN the past few issues we have presented abstracts from the recent I.C.C. report on 839 accidents occuring during 1941, among vehicles coming under its jurisdiction, in which the cause of the accident was either directly or indirectly traceable to a mechanical defect and/or failure. As you will recall, the ICC has attempted to analyze the 839 accidents, in order to determine the frequency, severity and the nature of the mechanical failures. A differentiation was made as between accidents involving mechanical defects or failures of various parts of the vehicles involved (1) while they were moving and (2) when they were standing or parked. Further, the accidents were classified as "collision" or "non-collision". The latter category has been further sub-divided into two sub-categories: "ditched" and "over-turns".

The portion of the ICC report which we are presenting this month deals with accidents involving coupling device failures or defects, on truck-trailer combinations, tractor-semi-trailers and also combinations of "towed" vehicles, including those in draw-bar drive-away operation. The ICC's findings on this particular phase of the accident report are as follows:

Of all the 839 mechanical-defect accidents in the report, 59 (or 7 percent) were classed as accidents caused by "failure of coupling devices".

Coupling devices are divided into three general types, namely: the fifth-wheel type, which is most generally used on tractor-semi-trailer combinations—the towbar (drawbar) type used in drive-away operations—and the towbar (drawbar) used in truck-full-trailer combinations; the latter two both properly designated as towbars (drawbars), differing substantially in design and mode of operation. There is one other type, notably the ball-and-socket type of coupling, most frequently employed in house-trailer combinations, infrequently encountered elsewhere, principally in certain types of automobile hauling vehicles.

Table 1 shows the coupling device defects, as reported on the accident reports, divided into the three types above mentioned. Of the coupling device defects, 49 percent of the accidents involved the "fifth-wheel" type, 27 percent the "towbar (drive-away)" type, and 24 percent the "towbar (truck-full-trailer)" type.

Accidents involving tractor-semi-trailers represent a very large percentage of all accidents reported to the Commission. The frequency of occurrence of coupling device defect accidents would therefore indicate that towbars—either drive-away or truck-full-trailer types—fail more frequently than fifth-wheels, considered on an exposure basis.

Of the fifth-wheel type of defects, "unintentional unhitching" represented 44.8 percent of the defects reported. "Shearing off" of the fifth-wheel from the tractor frame, and "locking or binding" of the fifth-wheel each represent 13.8 percent of the total defects reported on this type of coupling device.

The main defects reported on the towbar (drive-away) type of coupling device were 31.3 percent for "towbar broke", 18.8 percent for "towbar came loose", 12.5 percent for "guiding cable broke", and 12.5 percent for "drag-link came loose".

Only four different defects were reported on the towbar (truck-full-trailer) type of coupling, namely: "trailer broke loose", 35.7 percent; "drawbar broke",

(*Please turn to page* 131)

TABLE I—NUMBER AND PERCENT OF COUPLING DEVICE DEFECTS:

Number of Accidents	Percent	Type of Defect Causing Accidents:
		Fifth-Wheel Failures
13	44.8	Unhitched
4	13.8	Sheared-off tractor frame
4	13.8	Locked
2	7.0	Lock broke
1	3.4	Axle of rocking-plate broke
1	3.4	Bracket broke
4	13.8	Not specified
29	100.0	
		Towbar (Drawbar-Drive-Away Operations)
5	31.3	Broke
3	18.8	Came loose
2	12.5	Guiding cable broke
2	12.5	Drag-link came loose
1	6.2	Towbar head broke
1	6.2	Nut on king-bolt came off
2	12.5	Not specified
16	100.0	
		Towbar (Drawbar-Full-Trailer Combinations)
5	35.7	Trailer broke loose
4	28.6	Broke
3	21.4	Unhitched
2	14.3	King-pin broke
14	100.0	

"Our drivers like this plan..."

"Our drivers like this plan because of few road delays and minimum lost time. We like the 'U. S.' Transportation Maintenance Plan because it gives us a true picture of our tire cost per unit. This plan has been a big help in securing certificates for new tires because the O.P.A. appreciates our recapping and making necessary tire repairs before tires blow out. It has helped to increase our tire mileage." CASE HISTORY NO. 63

★

This fleet operator (name on request) reports that "U. S." Transportation Maintenance helps him get more tire mileage, cuts his operating costs and most important of all, helps save precious rubber.

Truck drivers like this plan, too, because it cuts down lost road time and brings them in on schedule. Maintenance men like it because it ferrets out causes of tire trouble before it happens and gives a day-by-day and tire-by-tire record that is complete and easy to keep. Truck operators like it because it cuts operating cost and provides the information needed for government reports.

See your "U. S." Truck Tire Distributor for full details. Phone or write him today.

"U. S." TRANSPORTATION MAINTENANCE

1. CUTS TIRE TROUBLE

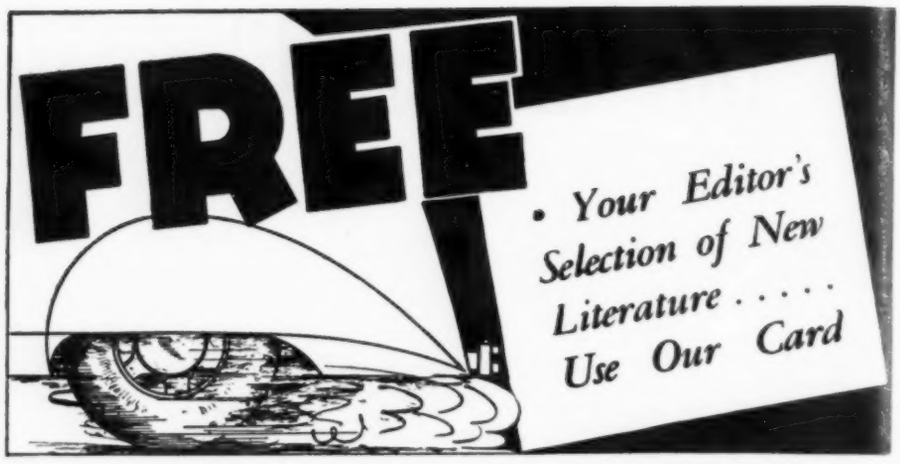
2. SAVES TIME

3. GIVES YOU UP-TO-DATE RECORDS

U. S. ROYAL FLEETWAY *First choice of truck and bus operators who want the most tire miles for every certificate they spend.*

UNITED STATES RUBBER COMPANY

1230 SIXTH AVENUE • ROCKEFELLER CENTER • NEW YORK 20, N. Y.



233. New Free Book Tells Things About "Electronics"

"Electronics" is a magic word, interest in which has been brought to new heights by the developments of war. . . . Electronic applications in industry, in the war, in medicine and in the home are illustrated and described in a new 44-page book brought out by Westinghouse. . . . Various types of electronic tubes—key units of every electronic device—for such applications as industrial control, diathermy, power conversion, X-ray and radio—are illustrated, and the primary use of each identified in this booklet, which comes to you *free* if you mark No. 233 on our post-card.

•

234. Free Booklet Explains the New, Detergent-Type Oils

The November issue of Texaco's publication *"Lubrication"*, is devoted entirely to the subject of heavy-duty, detergent-type oils. . . . If you have not seen it, you've missed one of the most comprehensive discussions on this subject. . . . It explains the new oils in plain, everyday language, telling just how they were developed, what they will and will not do, the various methods of testing them and their actual road-service characteristics. . . . This, we assure you, is *not* advertising matter. . . . Because we were positively intrigued when we read it, we've arranged to have extra copies mailed, *free*, to fleet men who mark No. 234 on our post-card.

•

235. New Brake Reliner's Manual Especially for Fleet Men

Johns-Manville has just issued its new *"Fleet Reliner's Manual"*, as a special service to those responsible for truck and bus fleet maintenance—and that's *you*. . . . Every function of every part of every brake and brake-control system is illustrated and described therein, together with step-by-step adjustment procedures. . . . It's an 80-page book containing scores of graphic, easy-to-understand illustrations and many trouble-shooting charts. . . . Ideal for training new men; the old ones will use it, too. . . . . If you'd like a *free* copy, just mark No. 235 on our post-card and we'll do the rest.

•

236. Free Wall-Chart to Help Conserve Tire Chains

The winter's not over yet, and your present stock of tire chains may *have* to last for the duration. . . . In order to help you over the rough spots, Pyrene offers a wartime wall-chart, 24" x 36", ready to hang up in the shop. . . . It tells how to use and conserve *all* makes of tire chains, including *when* to use them, how to *install* them, how to *repair* them and how to *conserve* them. . . . A *free* copy (or a quantity) will be supplied to fleet men who mark No. 236 on our post-card.

237. Wartime Information for the Delivery Truck Operator

Operators of trucks in retail or wholesale delivery will find much of value in Studebaker's new booklet, *"Wartime Information for the Delivery Truck Operator"*. . . .Its 52 pages are well illustrated with service data applying to *all* makes of trucks. . . . Besides, it provides a complete text and simple interpretation of ODT General Order No. 17, together with a series of questions-and-answers on the entire subject of government regulation of wholesale and retail deliveries. . . . Mark No. 237 on our post-card if you'd like a *free* copy of this helpful booklet.

•

238. Free Shop Manual on How to Service Fuel-Pumps

Our recent fuel-pump survey has indicated that there's lots of data lacking on this subject. . . . In order to help you, AC Division of G. M. offers a 64-page booklet entitled *"How to Service Fuel-Pumps and Gasoline Strainers"*. . . . Besides the illustrated, step-by-step procedure for repairing and overhauling them, the booklet includes a table of data showing fuel-pump cover positions, heat-shield stud positions and static pressure specifications. . . . All types of mechanical fuel and vacuum pumps are included. . . . Number 238 on our post-card means that a copy will be mailed to you, *free* and promptly.

•

239. Interchangeability Data on Ball Bearing Replacements

What do you do when you can't get your favorite make of ball bearing? Why, you ask for some *other* make, if you want to keep 'em rolling. . . . In order to help you in this, New Departure has compiled a book entitled *"Interchangeable Ball Bearings for Replacement"*. . . . It contains numerically-arranged lists of ten popular makes of ball bearings, together with the corresponding numbers of each make. . . . In addition, there are tables of dimensional tolerances and other shop data. . . . For your *free* copy, just mark No. 239 on our post-card and one will come through the mail.

FREE SHOP BOOKLETS TO HELP KEEP 'EM ROLLING!

•

240. Free Wall Chart Tells How to Mount Synthetic Tubes

Something *new* has been added in the way of procedure for mounting the new synthetic rubber tubes—you just *can't* do it the old way if you expect good results. . . . An illustrated wall-chart, showing the proper way to do the trick, is now offered free to all fleets. The idea is to overcome one of the greatest causes of unnecessary tube failures resulting from improper mounting. . . . Just jot down No. 240 on our card, if you'd like a *free* copy to come to you by mail.

•

241. How to Service Ammeters, Oil-Gauges, Fuel-Gauges, Etc.

At last someone has removed the veil of "mystery" surrounding (in many people's minds) those little instruments on the dash, including ammeters, water-temperature gauges, oil-pressure gauges, fuel-gauges, etc. . . . AC Division of G. M. offers you free, a 42-page booklet entitled *"How to Service Instruments"*. . . . This little shop manual tells how to locate the trouble, how to diagnose and how to correct it. It's just chock-full of shop pictures and detailed trouble-shooting data. . . . No. 241 on our post-card will bring you a copy promptly, without obligation.

•

242. Sixty-Two Short-Cuts Help You to Fix 'Em Fast

Here's a handy little pocket-size book entitled *"Cures for Motor Car and Truck Ailments"*. . . . Its pages are full of shop short-cuts; how, by the mere installation of an inexpensive gadget, you can make a *permanent* repair on those troublesome little jobs. . . . The items cover brake adjustments, valve-tappets, steering-gear levers, engine mountings, window-regulators, drain-plugs, pull-back springs, throttle-bushings, wheel-studs, etc. . . . On each page you will find the *remedy*, and the gadget that will help do the trick. . . . Number 242 on our post-card will bring you a *free* copy of this little book.

Long haul OR Short haul

AUTO-LITE STERLING Steelductor SPARK PLUG WIRES

. . . HELP KEEP TRANSPORTATION ON THE JOB!

If you have trouble maintaining schedules because of inferior or worn ignition cables it will pay you to find out about Auto-Lite Steelductor.

Today, Steelductor Spark Plug Wires are installed on the big majority of America's fighting planes. And that same efficient, dependable operation can be counted on by fleet operators in Steelductor cable designed for automotive use.

Steelductor is now available for cars, trucks and tractors. Write today on your letterhead for Auto-Lite Sterling Form No. C-503. Contains full facts about Steelductor High Tension Ignition Cable.

THE ELECTRIC AUTO-LITE COMPANY
TOLEDO, 1 *Merchandising Division* OHIO

FLEET OPERATORS AND MAINTENANCE MEN
Write today on your letterhead for Form No. C-503 describing the advantages of Steelductor Ignition Cable.

BACK THE ATTACK—BUY WAR BONDS

AUTO-LITE Automotive WIRE and CABLE

CAN MAKE THESE OF SCRAP

● If you happen to have any scrap angles and flats around the junk-pile in your shop, your welder can make you a nice pair of horses like those shown in the accompanying illustration, in a jiffy.

The longitudinal or top member is made of a piece of 90-degree angle iron. Legs and side braces are made of the flat stock.

Dimensions of the stuff used on this job are 2 x 2 x ¼ inches. However, other sizes that might be handy may also be used. A fore-and-aft brace connecting both pairs of legs, on each side, may also be desirable.

●

HOW MUCH ANTI-FREEZE?

● The new wartime-emengency alcohols which are now sold for anti-freeze purposes (ethanol alcohol) should be used in the following proportions, advise duPont engineers:

For systems requiring protection to as low as—55°F., a solution of three parts war-emergency compound and one part water should be used, while one part compound to one part water is sufficient down to—23°F., and one part compound to two parts water is safe down to 1°F.

Mixtures of different alcohol types of anti-freeze will combine satisfactorily without harm to rubber gaskets or metal parts of the cooling system. Operators are warned, however, not to spill the undiluted war-emergency compounds on painted surfaces.

To assure adequate protection, losses, if any, should be made up by adding a mixture of water and the emergency compound that is equal in strength to the mixture already in the system.

METALIZING KEYWAY SHAFTS

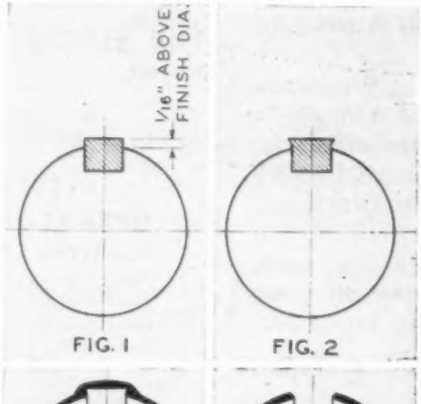
● Should you have occasion to build up a shaft by metal-spraying (or have it done outside) and if the shaft happens to have a keyway in it, here's a helpful hint to preserve the keyway, and at the same time secure a bond along the edges of the keyway that will prevent the coating from coming off.

The shaft should be undercut and roughed up in the usual manner and all burrs or rough edges removed from the keyway with a flat file. The four sketches show how to mask the keyway in such a manner as to eliminate remachining.

The "dummy" key shown is of cold-rolled steel. It should fit snugly and the sides polished smooth. Height of the key should be such that it will project 1/16" above the finished diameter.

Fig. 1 shows the prepared surface with the dummy key in place. Fig. 2 shows how the dummy key should next be peened over along the edges. The metal is then sprayed in the usual manner, over the key as well, as shown in Fig. 3.

The next step is to grind down the ridge over the dummy key so that it is flat with the surrounding surface. Removal of the dummy key is done by tapping it out with a hammer. Fig. 4 shows the finished job. Note the chamfer along the edges, which results from the peening of the key. This relief helps prevent the sprayed metal coating from lifting and also makes it unnecessary to refinish the keyway.



●

PREVENT THEM FROM FREEZING

● Several common types of fire extinguishers are subject to freezing and, if allowed to do so, may be rendered inoperative or even dangerous to use.

Soda-acid, foam and gas-cartridge extinguishers must be kept in relatively warm locations (above 40 degrees Fahrenheit to be safe) or in suitably heated cabinets. The National Board of Fire Underwriters specifies that cabinets for use in sub-zero climates be of ⅞ inch, double-wall construction and be heated by a continuously-burning incandescent lamp of not less than 50 watts. Single-wall enclosures, similarly heated, are suggested for locations where temperatures below zero Fahrenheit are not encountered.

Anti-freeze chemicals, such as common salt, calcium chloride and glycerine, should *not* be added to extinguishers of these types, since foreign ingredients may reduce the effectiveness or change the nature of the discharge, or corrode the parts and make the extinguishers dangerous to use.

Pump-tank and gas-cartridge extinguishers can be protected by adding anti-freeze chemicals supplied by the manufacturer. Chemicals other than these should not be used, however, as they may cause corrosion.

Extinguishers which do *not* require protection from freezing are the vaporizing-liquid, carbon-dioxide, and loaded-stream types. The first two contain no water; the latter does contain water, but has chemicals added which depress the freezing point.

Since the sale of all Underwriters' Laboratories approved extinguishers is now subject to priority restrictions, careful maintenance, including protection against freezing and an annual inspection and recharge, is doubly important.

Fruehauf Servicing Begins On The Drafting Board

Experienced owners know that Fruehauf Trailers are built to do the job assigned to them —with a minimum of attention. But, when service is needed, Fruehauf engineering has made the job easy.

For Fruehauf engineers had ease-of-servicing in mind when the Trailer was still in the blueprint stage. In every last detail of design and construction, they contrived to simplify the work of the maintenance man.

Nowadays, when it's more than just good business to keep your hauling equipment busy . . . producing as much and as long as possible . . . this painstaking care is paying big dividends to Fruehauf operators.

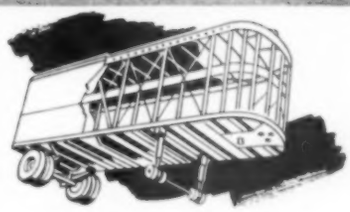
FRUEHAUF FEATURES THAT SAVE TIME FOR THE MAINTENANCE MAN...

ROOF

Roof comes in sections. To make repairs the damaged section is removed by taking out a few screws. Each seam is of the coin-pressed type, readily opened for a new section.

SUPPORTS

Support mechanism is constructed without the use of rivets or welding. The Supports can be totally disassembled by using only four common tools.

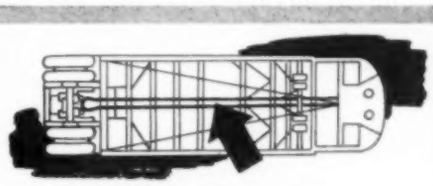


BODY AND FRAME

No sawing or planing when making repairs. Any damaged section can be cut out with a torch or a hack saw; and a new section quickly welded into place.

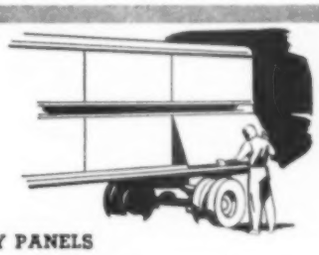
5TH WHEEL

All wearing parts can be removed without removing the 5th Wheel from the tractor. A chain hoist is not required for service. Not a single part is welded or riveted. 5th Wheel can be totally disassembled with common tools.



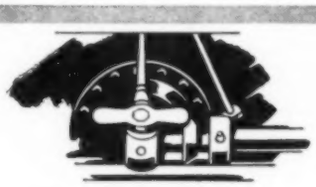
BRAKE POWER-LINES

All brake lines—either air or vacuum—can be easily inspected. They run down the center of the vehicle on the under side of the body. Time required for "trouble shooting" is kept to a minimum.



BODY PANELS

Body panels are secured to metal frame member with self-tapping screws, molding retainer, and snap-on molding. Replacement of panels is simple.

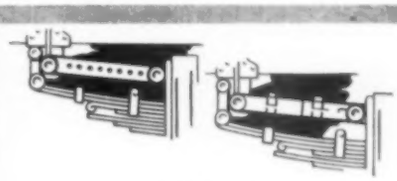


SLACK ADJUSTER

Fruehauf Slack Adjusters greatly simplify brake adjustment. The mechanic can make a perfect adjustment of the brake as the vehicle stands on the highway or on the service floor. The new-type Slack Adjuster is equipped with a wing-type wrench so that, normally, not even a wrench is needed.

BRAKE LINING

Linings can be readily changed. They are of the molded type, requiring no riveting or drilling. Can be removed from the brake shoe simply by removing the wheels and dust shields. The shoes remain on the Trailer. Each block of lining is bolted to the shoe.



RADIUS RODS

One radius rod is permanently fixed, the other is adjustable. The axle can be readily moved forward or backward to obtain perfect axle alignment without removing any portion of the radius rod. Radius rods are rubber-mounted at both ends, so no rebushing is ever required. And rubber cushions the jolts.

World's Largest Builders of Truck-Trailers *Service in All Principal Cities*

FRUEHAUF TRAILER CO. • DETROIT

ROLLER OR BALL BEARINGS FOR FRONT WHEELS?

THIS is as good a time as any to voice your views on post-war truck design, with particular reference to front-wheel bearings. . . . It's also timely to look into the *general* bearing situation. . . . Whether or not to use reground bearings; how to lubricate hubs, etc., being especially controversial. . . . And also to check into the current bearing shortage, which still seems to be *quite* critical.

Whether or not the bearing picture relaxes within the next few months, the data which this survey discloses (we hope) should be of value—even for post-war use. . . . However, since most of us are interested in the *present*, let's see what the *other fellow* is doing about bearings and bearing lubrication. . . . Surveys of this kind are *always* helpful; especially so today. You'll cooperate, won't you?—*Editor.*

(Please tear out and mail to The Editor, Fleet Owner, 90 West St., New York 6, N. Y.)

Question No. 145—Wheel Bearings

Which TYPE of bearings do you prefer for the following application? *(Please check ONE type only)*

Front Wheels: ☐Ball Bearings ☐Tapered Roller Bearings

Rear Wheels: ☐Ball Bearings ☐Tapered Roller Bearings ☐Straight Roller Bearings

Please give your reasons for the above:.....

.....

Have original-equipment bearings given satisfactory service in the past? ☐Yes; ☐No; ☐Sometimes

If not, what is your principal complaint?.....

How often do you re-pack and adjust front wheel bearings?..... Rear wheel bearings?.....

What method do you use for the above? ☐Pack by hand; ☐Use bearing packer

In your opinion, how should wheel-hubs be packed? ☐Fill hub with lube; ☐Half-full; ☐Pack bearings only

Do you use reground or rebuilt bearings? ☐Yes; ☐Tried them and quit; ☐Never tried them

What has your experience been with reground or rebuilt bearings? ☐Satisfactory; ☐Unsatisfactory

If unsatisfactory, please explain.....

What *makes* of anti-friction bearings do you prefer for replacement? *(Please fill in the makes below)*

Ball Bearings..... Any special reasons?.....

Tapered Roller Bearings..... Any special reasons?.....

Straight Roller Bearings..... Any special reasons?.....

What is your *principal* source of supply on bearings? ☐Vehicle Dealer; ☐Automotive Jobber

Do you have trouble in obtaining replacement bearings?..... If so, what make and type?.....

REMARKS: *(Use this space for comment, or for anything not covered above)*.....

.....

.....

How many vehicles in your fleet? *(Please indicate below)*

Trucks..... **Tractors**..... **Trailers**..... **Pass. Cars**..... **Buses**..... **Miscellaneous**.....

Mail THIS COUPON FOR FREE SURVEY

Name of Firm.....

Address .....

City and State.....

Your Name .....*Position*.....

Remind Your Organization to Save the Carcass—NOW!

—TO SAVE YOUR BUSINESS . . . TO SAVE THEIR JOBS

A frank statement about the most serious situation the Trucking Industry has ever faced

Save the Carcass to Save Your Job

In 1944, there just aren't going to be enough new truck tires to go around . . . not nearly enough.

Military demands for tires have been greatly increased. Civilian operators must take immediate conservation steps or many trucks will have to be laid up.

This means, simply, that the most valuable asset any business owns today is the carcasses of the natural rubber tires on its trucks.

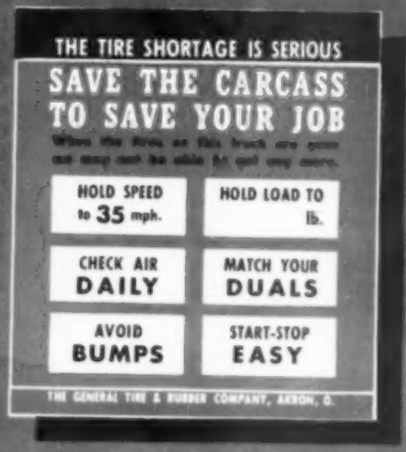
Your tires must last, and last, and last. They must be recapped as soon as the tread wears smooth—or your truck may not roll.

This is a frank warning of a crisis that can put you out of a job. If you "wait and see"—it may be too late.

Right now is the time to start caring for those carcasses as you've never cared for them before.

Hold Speed to 35 m. p. h.
Check Air Pressure Daily
Avoid Bumps and Sharp Objects
Observe Payload Limit
Match Dual Tires Properly
Start and Stop Easily

THE GENERAL TIRE & RUBBER COMPANY
AKRON, OHIO


THE TIRE SHORTAGE IS SERIOUS
SAVE THE CARCASS TO SAVE YOUR JOB
HOLD SPEED to 35 mph.
HOLD LOAD TO lb.
CHECK AIR DAILY
MATCH YOUR DUALS
AVOID BUMPS
START-STOP EASY
THE GENERAL TIRE & RUBBER COMPANY, AKRON, O.

FREE

GARAGE POSTERS
(12½" x 19")

DASH STICKERS
(3¼" x 3½")

The straight-talking garage poster (shown at left) and the constant-reminder dash sticker (above) are FREE in any quantity required. Just write us in Akron, or see your local General Tire dealer.

No question about it, the 1944 truck tire crisis can put you out of *business*. That is why you and your organization must remember constantly the importance of saving tires.

To help you . . . we have developed this timely reminder program for your organization—built around the very real, brutal fact that without tires, they will be out of a *job*.

It is our contribution to the most serious situation the trucking industry has ever faced. Put this program to work! Order your posters and stickers today.

THE GENERAL TIRE & RUBBER COMPANY • AKRON, OHIO

Middlekamp Succeeds Vaniman on WPB

THE appointment of Lt. Col. John H. Middlekamp as Director of WPB's Automotive Division was announced last month. . . . He succeeds R. L. Vaniman, who resigned to accept a position as vice-president of the Fruehauf Trailer Co., Detroit, Mich. . . . Lt. Col. Middlekamp was Chief of Production of the U. S. Army's wheeled vehicles—trucks, half-tracks and trailers—from June 1942 to the present. He has resigned from the Army to accept the WPB post. . . . Middlekamp was formerly Supt. of Equipment, Board of Transportation, New York City, from 1925 until Jan. 1942.

•

SAE Holds Annual Meet in Detroit

ONE of the most interesting (to fleet men) annual meetings of the SAE was held in Detroit last month, by the Society of Automotive Engineers. . . . While most of the subjects discussed were directly related to wartime motor vehicle and aviation engineering, there were several interesting papers of direct concern to fleets. . . . Four of them have been selected by the Editor of this publication as worthy of more than mere mention, and rather lengthy abstracts of them appear in this issue. . . . You'll find it worth your while to check for them.

•

FWD Gets Army-Navy "E" Award

THE FWD Auto Company, Clintonville, Wis., has recently been awarded the Army-Navy "E" for excellence in war production. . . . The award was delivered by Col. John A. Slezak, deputy district chief, Chicago Ordnance District. . . . Walter A. Olen, president and general manager, accepted the flag on behalf of his employees and company.

•

Boggs Manages Autocar Branch

THE Autocar Company announces the appointment of H. I. Boggs as manager of its branch in Cincinnati, Ohio. . . . Mr. Boggs was connected with Mack for 24 years, first as salesman, then as Akron manager, and finally as manager of their Cleveland branch. . . . For the past year Mr. Boggs has been in charge of all motor trucks and other transportation facilities of the National Refining Company, Cleveland, Ohio.

Trailer Makers Elect New Officers

AT a recent meeting of the Truck-Trailer Manufacturers Association, held in Washington, D. C., the following officers were elected; President, E. J. Lucas, of Kingham Trailer Company, Louisville, Ky. . . . Elected eastern vice-president was J. L. Glick, president, Truck Engineering Corporation, Cleveland, Ohio. . . . The choice for western vice-president was A. R. Trombly, of Trombly Truck Equipment Co., Portland, Ore. . . . H. N. Brown, president, Keystone Trailer & Equipment Co., Kansas City, Mo., was re-elected treasurer.

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PLANE loading is simplified with this type of jack-knife hoist. . . . The idea is not new, but the plane is—a big Curtis C-46 Commando. . . . There'll be plenty of this after war—don't you think?

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G.M. Diesel Division at Saginaw

THE Grand Rapids plant operated by the Saginaw Steering Gear Division of General Motors, has now become an independent division of General Motors, known as the Diesel Equipment Division. . . . It will manufacture injectors for all General Motors Diesel engines. . . . C. F. Runchey, manager of the Grand Rapids plant, will manage the new division. . . . C. W. Truxell of the Detroit Diesel Division's engineering staff, will be chief engineer of the Diesel Equipment Division.

•

Rowold Named Mack Vice-President

THE appointment of Henry Rowold as vice-president of Mack-International Motor Truck Corporation, has been announced by F. F. Staniford, president. . . . Mr. Rowold joined the Mack organization in 1919 and later became assistant to the president. . . . He was placed in charge of national account sales in 1939 and as vice-president, will continue in that capacity. . . . Mr. Rowold is also a committee member of the Central Truck Tire Rating Board of OPA.

IHC Creates Separate Truck Division

THE International Harvester Company announces the creation of a separate motor truck division of the company, to have entire control of design, production and distribution of International Trucks. . . . P. V. Moulder, former assistant to the second vice-president, has been appointed general manager of the new truck division. . . . Moulder's executive staff will be composed of five members, as follows: W. D. Reese, Manager of Engineering; V. A. Guebard, Manager of Manufacturing; D. A. Conroy, Manager of Supply and Inventory; W. C. Schumacher, Manager of Sales; and Glenn D. Wade, Divisional Comptroller. . . . Mr. Moulder's career with IHC covers more than 33 years.

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Private Carriers Meet at Chicago

MEN responsible for the operation of more than a million private motor trucks of America met in Chicago last month, with the nation's military, war agency and industry leaders, at the War Conference of the National Council of Private Motor Truck Owners, held on Jan. 27 and 28th. . . . Subjects discussed include: *The Truck Tire Situation; Looking Ahead in Truck Production; Looking into the Future with the ODT; and Private Carriers in the War Effort.* . . . Jos. B. Eastman, ODT Chief, was guest speaker and told the convention just what they may expect in 1944. . . . A more complete report will appear in our next issue.

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Only 400 Trailers Left on Jan. 1

JOS. EASTMAN, director of ODT, in talking before a recent meeting of the Truck-Trailer Manufacturers Association, revealed the fact that on January 1 of this year there were only 400 trailers left in the nation's reserve pool. . . . This, out of a total of 17,700 trailers in the pool when rationing began. . . . Mr. Eastman also stated that common carriers received 31 percent of the trailers released; the oil industry got 19 percent; loggers 14 percent; war projects 7 percent; the balance being divided up among miscellaneous industries, including agriculture, manufacturing, wholesale food, mining, etc. . . . As you know, there are 25,000 new truck-trailers scheduled for civilian production in 1944.

New Studebaker information guide

helps you co-operate with Uncle Sam

HUNDREDS of letters from trade association officials say this big new 52-page information guide is just what delivery truck operators need.

It's a complete summary and explanation of all the government regulations on retail and wholesale delivery operations. It tells you clearly just what, when and where you may deliver.

And besides that, it contains many pages on the proper care of all makes of trucks in wartime.

This book is just one of Studebaker's many free wartime services. To get your free copy, see any Studebaker dealer — or if you prefer, mail coupon or drop a note at once to Studebaker headquarters. No obligation whatsoever.

STUDEBAKER

PIONEER AND PACEMAKER IN AUTOMOTIVE PROGRESS

Now building Wright Cyclone engines for the Boeing Flying Fortress . . . multiple-drive military trucks—other vital war matériel

THE STUDEBAKER CORPORATION
Dept. FO-2, South Bend 27, Indiana

Send us free and postpaid your 52-page handbook, "Wartime Information for the Delivery Truck Operator."

Mr......

Firm.....

Address.....

City.....*State*.....

By Rotor Swift

WHAT DOES the LAW SAY?

THERE are many legal principles which no fleet owner can afford to ignore, and these rules *can* be explained in simple language, without resorting to the jargon of the courts. . . . This department will undertake to explain such general points of law, without using any legal terminology. . . . Each one is based upon an actual American court decision but all names are fictitious.—Ed.

"Common Carrier" Defined

A STATUTE in Pennsylvania provides: (1) That the term "common carrier" includes all trucks, cars and buses conveying property or persons for profit between points within the state. (2) That all such common carriers come under the control of the state's Public Service Commission.

The Small Fleet (which lived up to this fictitious name) thought that they could ignore the Commission's rulings and went merrily on, hauling for-hire, without abiding by any of the formalities required.

"Our jurisdiction covers all common carriers operating between points in the state," the Commission pointed out. . . . "Yes, but we operate between points in just one county and not outside of it", claimed the Small manager, "so we're not operating between points in the state, within the meaning of the law."

But the Pennsylvania courts decided in favor of the Commission and now the Small Fleet is sticking to the Commission's regulations—and liking it.

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The "Disputed" Insurance

THE manager of the Corvette Fleet reached for the telephone, called the salesman with Ajax Jobbers, and bought all of the truck accessories and parts stored in a certain warehouse for $5,000. . . . Then the manager dialed another phone number for this conversation:

"Is this the Midland Insurance Company?" And the net result was that Midland insured the contents of the warehouse against loss or destruction by fire. . . . Five days later the fleet manager called the insurance company. "I've just learned that a fire has destroyed all of our supplies that we insured with you the other day."

"We already know that," the insurance man answered, "but we also know (now) that your purchase of those supplies was oral and therefore was not binding in law, and you had no supplies to insure." . . . "You may be right," was the manager's comeback, "but we'll see what the courts have to say on that point."

"The oral contract to purchase was not void or illegal by reason of the statute of frauds; it affects the remedy only as between the parties, and not the validity of the contract itself; and where the contract has actually been performed, even as between the parties themselves, it stands unaffected by the statute," said the Massachusetts court, in ruling in favor of the Corvette Fleet, recently.

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The "Tricky" Contract

"WELL, it was this way," the purchasing agent of the Hurricane Fleet explained: "A certain salesman for a new wholesaler came into my office just three months ago and offered to sell me $750 worth of certain supplies to be delivered in three months, and I signed up to that effect."

"So, what do you want of me?" asked the Hurricane attorney. . . . "What do I want of you? Why, he got my signature through plain fraud—he made me believe that he was the only salesman who had any of that stuff for sale; then I found out that I could have bought it in a dozen places," the purchasing agent exploded.

"Then I suppose you want me to enter suit against the wholesaler for damages?" . . . "Yes, but there's a clause in the contract which I failed to read at the time; a clause that prohibits us from entering suit for fraud or misrepresentation against them for six months after the date of the contract," the purchasing agent explained.

The lawyer lit up a fresh cigar and said: "If that's all, you have nothing to worry about," and removed a large volume of reports from a nearby shelf, reading of a recent case of this kind, in which the court said:

"Attempts under the form of a contract to secure total or partial immunity from liability for fraud are all under the ban of the law. The extent of relief granted to the injured party, in order to be adequate, cannot be restricted by the act of the parties."

"That sounds good, and I'm luckier than I deserve to be," the purchasing agent admitted, "but I'll certainly read every contract thoroughly in the future."

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The "Collision" Clause

THE Quaker Fleet held a blanket policy on its 23 trucks, containing the usual "collision" clause. There was also an additional clause covering any damage to the trucks occurring "while entering or leaving any building adjoining any highway."

One of their trucks stored in a certain garage was struck by another truck *in the garage*, and the insurance company refused to pay the damages.

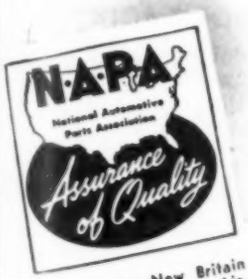
"The extra clause covering damages sustained in 'entering or leaving any building' shows that the collision clause does not apply where the truck is in the building," the insurance company's lawyer contended.

However, the Pennsylvania courts ruled otherwise, and the insurance company had to pay up. The courts contended that the collision clause applies at all times, and in all places. The entering and leaving clause is just an "extra", intended to cover damage not caused by a collision if the damage occurs while entering or leaving, was the fleet's claim, upon which the decision was based.

USE THE PLUS IN YOUR TOOLS!

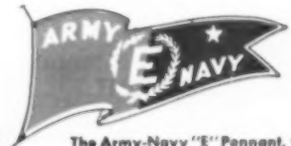
An accepted feature of the skillfully balanced, standard Tool Kit, as New Britain produced it before the war, was its versatility. It has become a huge asset today. Because, now, when you have difficulty replacing highly specialized Tools, you can look to the scores of practical combinations your old stand-bys offer. Undoubtedly, within your present Kit, there are several basic, standard Tools such as New Britain's famous sockets, extensions and handles that can master today's specialized repair problems easily.

When you use this PLUS in your standard Tools and Hook Up their Versatility, you aid the war effort in more ways than one. First you maintain the high standard of your repair work that keeps essential vehicles rolling . . . and second, you hold the demand for new Tools down while you keep the savings in vital alloy steels up. The New Britain Machine Co., New Britain, Conn.



The complete New Britain Line for Automotive, Aircraft, General Maintenance & Production Needs is sold by leading Jobbers. Master stocks are maintained in 38 NAPA Warehouses.

New Britain



The Army-Navy "E" Pennant, with star, flies over New Britain's plants, signalizing outstanding production of machine tools, aircraft engine parts and projectiles.

THE NEW BRITAIN MACHINE CO. · HAND TOOLS

O.D.T. NEWS

MANY CARRIERS IDLE

● ODT recently revealed the results of a survey which indicated that 6.1 percent of motor common carriers in Illinois, Indiana and Wisconsin are idle, because of lack of drivers. . . . Illinois Selective Service director has urged all state draft boards to give serious consideration of the war-essential status of trucking company employees. . . . Idle truck-days represent total monthly truck-days lost of 25,212, or a loss in the movement of essential freight equivalent to 250,000 tons a month in the three states.

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DON'T PUT IT OFF

● If you have received ODT's double post-card request for a monthly operating report and have failed to supply the desired information on time, better get busy, for nobody will be penalized but you. . . . We understand that ODT checks these reports for factual information each time that an appeal for additional gasoline or mileage is made. . . . And, if your current report is not in, they say you'll get little attention.

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DAIRY INDUSTRY PLAN

● A saving of more than 145,000 truck-miles a year will be accomplished under a dairy industry transportation plan for Whatcom County, Wash., although a year ago that county's committee told ODT that it could see no possible way to save a single additional mile. . . . The plan, opproved by ODT, affects 3,680 producers, 64 motor carriers and 7 plants operated by 6 processors, all located within the county.

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ODT APPOINTMENT

● The ODT recently appointed Fred B. Hufnagel, Jr., of Philadelphia, Pa., as a consultant on tank trucks in the Division of Petroleum and Other Liquid Transport. . . . Mr. Hufnagel is associated with the Sun Oil Company as manager of its motor transportation department.

TO TAKE OVER TRUCKS?

● The Federal Government is said to be devising plans to take over the nation's truck lines, in the event of labor difficulties. . . . The labor situation with the truck lines, however, is different from that the railroads. . . . Contracts with labor unions are usually on a regional basis, expiring at different times, and it seems unlikely that a nationwide strike would develop in the trucking industry.

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"CWN" GOOD INDEFINITELY

● ODT points out that Certificates of War Necessity, required for all commercial vehicles, do *not* bear any expiration date, but shall remain in effect until amended, suspended, cancelled or revoked. . . . Where certificates are amended, new ones are issued. . . . In cases where gasoline and mileage allotments were adjusted in 1943, the changes will be carried over into 1944. . . . OPA has left to the discretion of local boards, whether to mail ration coupons or to require operators to call for them.

●

JOINT-ACTION COAL PLANS

● Massachusetts coal dealers will save more than 650,000 truck-miles and about 43,000 man-hours a year under four joint-action plans for cooperative retail deliveries of solid fuels by motor truck, approval of which was recently announced by ODT. . . . The mileage saving is estimated at 10 percent under normal yearly deliveries. General provisions include full cooperation among all dealers on fully-loaded trucks, interchange of manpower, vehicles, yard equipment, etc.

●

MORE DAIRY INDUSTRY PLANS

● Nine new dairy industry transportation plans announced by ODT recently will save more than 4,000,000 truck-miles and almost 300,000 man-hours annually in the movement of dairy products from farms to plants in Arkansas, Georgia, Illinois, Minnesota, Missouri, Oklahoma and Texas, according to a spokesman for ODT.

TANK-TRUCK JOINT-ACTION

● ODT announces a program calling for the appointment of tank-truck advisory committees on national regional and state levels and the establishment of a procedure for joint-action in cooperative less-than-truck-load deliveries of petroleum products. . . . ODT will embark immediately upon a program of complete reorganization of the various state ODT tank-truck advisory committees, and will give them a definite outline of the scope of their activities and responsibilities under the new procedure.

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MORE COAL JOINT-ACTION

● ODT announces approval of 15 new joint-action plans for cooperative retail deliveries of solid fuels by truck, under the national program for the conservation of vehicles, tires, gasoline, parts and manpower. . . . The plans cover operations in portions of California, Connecticut, Nebraska, New York, Ohio and Wisconsin. . . . They will effect substantial savings in truck-miles and man-hours.

●

MORE DAIRY JOINT-ACTION

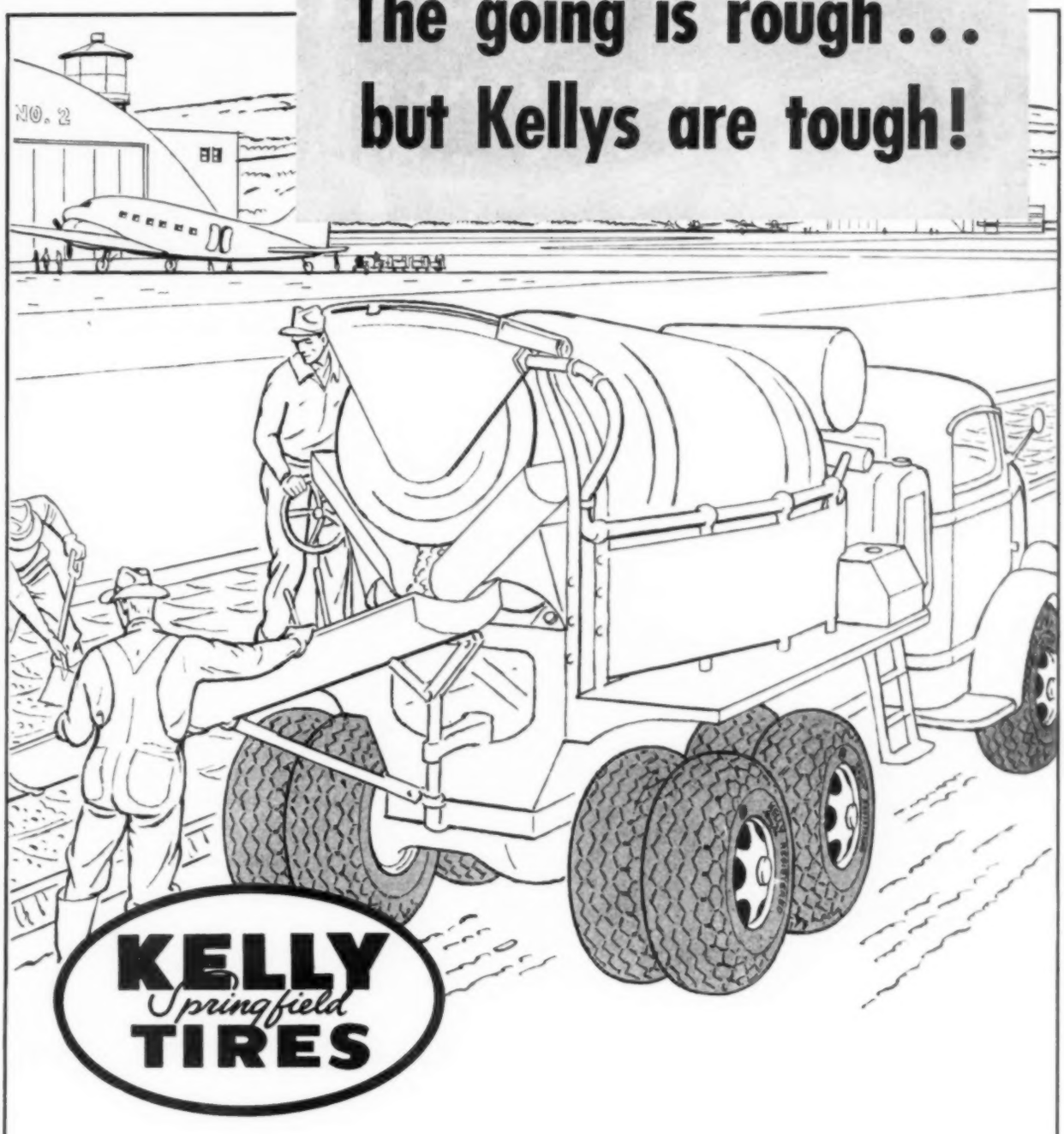
● Ten new dairy industry transportation plans announced by ODT will save more than 2,000,000 truck-miles and almost 147,000 man-hours annually in the movement of dairy products from farms to processing plants in Georgia, Illinois, Massachusetts, Michigan, Missouri, North Dakota, Ohio, Tennessee and Wisconsin.

●

ODT APPOINTMENT

● ODT recently announced the appointment of John R. Hanna of Lansdowne, Pa., to the staff of the Tank Truck Section of ODT's Division of Petroleum and Other Liquid Transport. . . . Mr. Hanna will work with state and district tank truck delivery committees in the solution of the problems which arise in the local delivery of petroleum products. . . . He comes to ODT from the Atlantic Refining Company and has been active on various ODT committees in the past.

The going is rough... but Kellys are tough!



KELLY *Springfield* **TIRES**

KEEPING AMERICA WINNING the war means rough, tough jobs for trucks —and tires. That's why more truckers buy Kellys—Kellys are Tough!

The same careful, dependable workmanship that built up Kelly's reputation for Dependability over a 50-year period is back of the tough Kelly Truck Tire of today.

And, as synthetics replace natural rubber, that Kelly building skill is as good a guarantee as you can get of dependable performance now. Every tire body in use today must be saved and recapped. Loads and Speeds must be kept to Wartime Limits.

★ ★ ★

The Kelly Tire Dealer can help you. Look to him for tire-saving suggestions; inspection, repair and recapping service.

THE KELLY-SPRINGFIELD TIRE COMPANY, CUMBERLAND, MARYLAND

(Use Post-Card—p. 82, for More Data on Any that May Interest You)

New, Hard Overlay Metal

A NEW overlay metal, called "Kerk-Aloy", was developed for the purpose of re-facing worn metal faces, edges, wearing surfaces, etc., to restore them to their original efficiency.

The new metal bonds well with any metals, excepting lead or aluminum. Because of its high resistance to wear, it is recommended by the maker for hard-surfacing such things as harrow-points, steam-shovel and dredge lips, dippers, etc. Automotive uses include the refacing and reclamation of tappets, rocker-arms, push-rods, wrist-pins and numerous others.

"Kerk-Aloy" can be applied with an acetylene torch or an electric arc. It does not require the use of a bonding flux and is said to flow evenly without gasification.

Free literature can be obtained directly from the makers, Kerk-Aloy Company, Bloomington, Ind. . . . We always appreciate it when you mention FLEET OWNER.

•

Wall-Chart on Tire Chains

A WARTIME wall-chart that tells how to use and conserve all makes of tire chains has been produced by the Pyrene Manufacturing Company, Newark, N. J., makers of Pyrene tire chains.

The chart, designed for posting by automotive fleet operators, makes suggestions on the following important points: (1) Using Chains When

Needed. (2) Installing Chains Properly. (3) Repairing Chains Promptly. (4) Conserving Chains by Good Driving.

A free copy of this chart, 24 x 36 inches, will be sent on request. Write directly to Pyrene Manufacturing Co., Newark 8, N. J. mentioning this announcement in FLEET OWNER, please.

Fruehauf Calendar for 1944

MOTOR transport in wartime is depicted in the interesting Fruehauf Trailer Company calendar for 1944.

Several interesting examples of the way in which truck-trailer equipment

is helping to speed victory are shown at the top. The calendar itself is clear, distinct and a good example of fine typography.

All twelve months are shown on one sheet. Under the picture are full-year calendars for 1943 and 1945.

For your free copy address the Fruehauf Trailer Company, Detroit, Mich., mentioning this announcement in FLEET OWNER, please.

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Free Book on Electronics

ELECTRONIC applications in industry, in the war, in medicine and the home are illustrated and described in a new 44-page booklet announced by Westinghouse Electric and Manufacturing Company.

A few typical applications shown in this booklet *"Electronics At Work"* are: Resistance-welding control for sewing plane parts together at 1,800 stitches per minute; cathode ray oscillograph for electrical circuit and lightning phenomena analysis at speeds of 1/100 of a millionth of a second; high-frequency induction heating units for plastic molding; tin reflowing and surface hardening; ignition rectifiers for converting alternating to direct current in aluminum and magnesium production; industrial X-ray units for "inside" inspection of vital metal parts; Precipitron for removing air-borne dust particles as small as 1/250,000 of an inch.

Various types of electronic tubes, key units of every electronic device, for such applications as industrial control, diathermy, power conversion, X-ray and radio are illustrated and the primary use of each identified.

A copy of the booklet (B-3264) may be secured free from Department 7-N-20, Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa.

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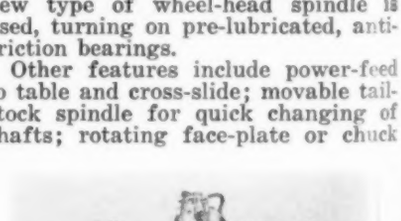
Van Norman Crankshaft Grinder

VAN NORMAN has recently added a new (No. 111) crankshaft grinder to its line of 16 automotive service machines.

The new grinder is 15 ft. long, has a 36-inch wheel, takes shafts up to 84 inches, with a 24-inch swing. The system of crank-holding fixtures is said to cut set-up time materially. A new type of wheel-head spindle is used, turning on pre-lubricated, anti-friction bearings.

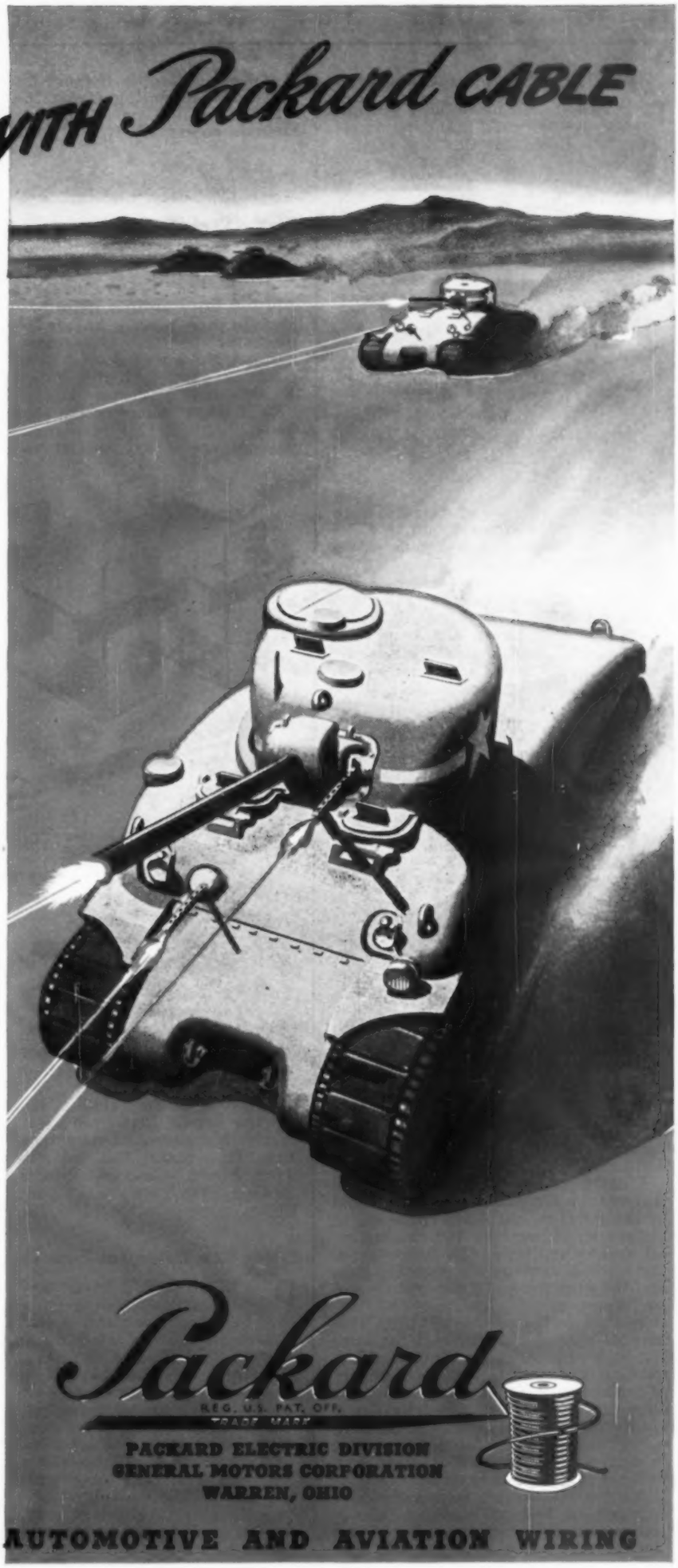
Other features include power-feed to table and cross-slide; movable tail-stock spindle for quick changing of shafts; rotating face-plate or chuck



with 360-degree graduations; three work-head speeds—20, 40 and 60 rpm; table traverse speed varies from 10 to 50 inches per minute. The machine requires a floor space of 22 x 6 feet.

Deliveries can be made on AA-5 priorities, or higher. . . . For more details address Van Norman Company, Springfield, Mass. . . . You'll mention FLEET OWNER, won't you?

You're RIGHT with Packard CABLE



In tanks and trucks, in landing boats and lighters, in hard-hitting fighters and high-flying bombers —Packard cables are "carrying the current" that brings engines into roaring life.

To these important military assignments, Packard Electric brings the skill and technical knowledge that have been developed through forty-three years of cable manufacturing. Packard cable has long been the original equipment choice on a majority of cars sold—the replacement choice of leading service stations, car dealers and garages. It is used by the major airlines, and by a majority of truck and bus fleets. At the Indianapolis Speedway, too, every winning driver during the last thirteen years of the races used Packard cable in his racing car.

What does this mean to you? It means that when you use Packard cable, *you know you're right!*

★ ★ ★

Electrical Service Begins With Good Wiring

Ask your Packard jobber about

PACKARD CERTIFIED RE-WIRING SERVICE

Based on proper checking and replacement procedure, using Packard cable.

★ ★ ★

Save Lives—Speed Victory

BUY WAR BONDS

Packard

REG. U.S. PAT. OFF. TRADE MARK

PACKARD ELECTRIC DIVISION
GENERAL MOTORS CORPORATION
WARREN, OHIO

FOREMOST BUILDER OF AUTOMOTIVE AND AVIATION WIRING

New Small-Size Hose Clamps

THE Aero-Seal line of hose clamps, made by Aircraft Standard Parts Company, Rockford, Ill., now covers,

in 16 models, all sizes of standard hose from ¼" inside diameter up to 4".

The new additions are models M-6 and M-10 for hose sizes from ¼" up to ¾" inclusive. The former is designed for ¼", ⅜" and ½" hose; the latter for ⅝" and ¾" hose. By using the extra take-up in the band, the M-10 can be used on all five sizes of hose from ¼" to ¾" when necessary.

The band is a spring steel strip, perforated to correspond with the teeth of the worm gear. It is drawn through the housing by a worm-gear thumb-screw. The perforations extend sufficiently to permit a full take-up. No locking wire is said to be needed.

A circular, now available, gives full data on the complete line of Aero-Seal hose clamps. . . . When writing for your free copy address Aircraft Standard Parts Company, 1711-19th Ave., Rockford, Ill., mentioning FLEET OWNER, if you don't mind.

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New Manual Covers Pistons

ANYONE interested in adding to his knowledge of how to prolong piston life and efficiency in today's essential automotive vehicles, should find helpful data in the new manual recently published by the technical staff of Aluminum Industries, Inc., Cincinnati, Ohio, makers of Permite Automotive Parts.

This 16-page manual, entitled *"The Automotive Engine Piston"*, as stated in the preface, has been prepared to impart an elementary but fundamental understanding of the functions of the internal-combustion engine piston and the principles of its operation and performance.

Written in "easy-to-read" style, this manual provides useful text material for both apprentice and more experienced mechanics, as well as members of automotive study courses. The War Department has recognized its desirability for publication in the form of a Technical Manual for use of troops in advanced mechanics' courses and field maintenance personnel.

Automotive service men and others engaged in helping maintain essential automotive transportation vehicles, may obtain a free copy of *"The Automotive Engine Piston"* by writing to Aluminum Industries, Inc., Cincinnati, Ohio, mentioning FLEET OWNER, please.

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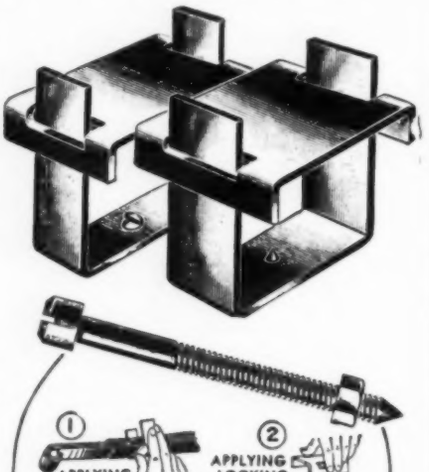
New Spring Repair Kits

SPRING repairmen are said to be welcoming with open arms the new Maremont Spring Repair Kit. It makes the work of reassembling springs when leaves are changed or new leaves added, a quick, easy job that can be readily handled by any mechanic.

Each Maremont Spring Repair Kit contains two "Kwick-On Spring Klips" and a center bolt. These "Kwik Klips" simplify the spring reassembling job by fast installation without use of any special tools.



The kits are available in three sizes, which cover a large portion of springs being repaired in the average shop.

If you cannot obtain Maremont Spring Repair Kits from your jobber, write Maremont Automotive Products, Inc., South Ashland Avenue at 16th Street, Chicago, Illinois, mentioning FLEET OWNER, if you please.

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New Detergent-Type Oil

DEVELOPMENT of a new detergent-type lubricating oil which is said to reduce wear and assure engine cleanliness and oil stability for low-speed Diesel engines, is announced by Standard Oil Company of Indiana.

Many such engines give clean operation with conventional oils, but where dirty operation cannot be corrected by mechanical adjustment, the new detergent-type lubricating oil can be used, according to Standard Oil engineers. The new oil will thus prevent ring-sticking, piston scuffing and excessive sludge and gum deposits, it is claimed.

The detergency results from the use of an additive which is both a detergent and an oxidation inhibitor.

When a lubricant without detergency is used, carbon and other products of oxidation, as well as dirt, stick to each other and to engine parts. They deposit in rings and on valves and clog filters. Wih the new detergent-type lubricating oil for low speed Diesels, however, a film coats the carbon and dirt, prevents particles from sticking and holds them in suspension until they are trapped by a filter or drained from the engine, according to Standard Oil engineers.

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Fire Prevention Booklet

TO INSTRUCT users of welding and cutting equipment in reducing potential fire losses, the International Acetylene Association has prepared a convenient, 16-page, pocket-size booklet entitled *"Preventing Welding and Cutting Fires."*

This booklet, written in easy-to-understand style, contains brief, clear discussions of the chief causes of fires and practical, common-sense measures for preventing them.

A copy of this booklet should be placed in the hands of every welding and cutting operator. It may be obtained in reasonable quantities, without charge, directly from the International Acetylene Association, 30 East 42nd Street, New York 17, N. Y.

•

Paint-Spraying Wall Chart

A NEW wall chart giving paint-spraying rules, showing how to save paint, air, time, power, fuel and equipment, and to reduce time lost because of sickness or accident, and improve results in general, is now available free to our readers.

The data given in this chart applies to all types of paint-spraying equipment, regardless of manufacture. Free copies will be sent on request to Eclipse Air Brush Company, 400 Park Avenue, Newark 7, N. J. . . . Mention of FLEET OWNER always helps.

When Johnny Comes Marching HOME . . .

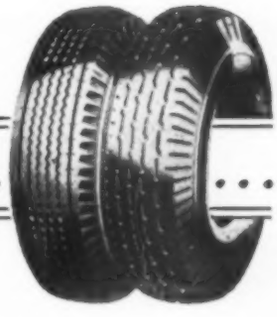
SOME DAY this great moment will be here. To children, the soldiers' return will be a happy celebration. To adults, the return of each son or brother will be surrounded with rejoicing and thanksgiving. Though they are more mature now, these boys who left home with shining, eager faces and mischievous looks in their eyes are still the same boys. The memories of their many good qualities need no revision. Needing no revision either is the memory of exceptional service given by Mohawk Quality Tires. When Johnny comes marching home, Mohawks will be waiting to give him top tire performance again.

Mohawk's Free Flex Tire Repair Unit

Mohawk Tire Rebuilding Materials

The night and day tire production of Mohawk factories is swelling the supply of "rubber" for jeeps, trucks and countless military vehicles. Mohawk's tire rebuilding materials division is likewise busy turning out Free Flex Repair Units, Air Bags and Recapping Stock to help get the last mile out of truck and passenger car tires. Because of an overwhelming demand, filling of orders for these materials may sometimes be delayed.

The Mohawk Rubber Co.
Akron 5, Ohio

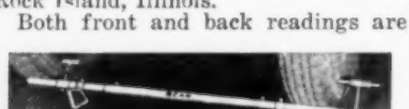


MOHAWK *Quality will be Remembered . . .*

New Bear "Tram" Gauge

A NEW, improved one-man Tram Gauge for making quick wheel toe-in checks, has been announced by the Bear Manufacturing Company, Rock Island, Illinois.

Both front and back readings are



taken on the same wheel with the indicator against the outside of the tire. The gauge checks all wheel sizes and is adjustable to all tread widths, the company announcement stated.

The measuring scale registers amount of toe-in or toe-out in fractions of an inch. The gauge operates on all cars, trucks and buses.

For more details address Bear Manufacturing Co., Rock Island, Ill., mentioning FLEET OWNER for quick service.

•

New Battery Service Manual

A NEW 39-page battery service manual is announced by the Association of American Battery Manufacturers, Akron, Ohio. . . . Simply written and profusely illustrated, it is intended as a handbook for battery manufacturers, service men, salesmen, and consumers.

The new manual tells of battery construction, how the battery works, battery capacity, battery stock maintenance, new battery installation, factors affecting battery life, servicing, testing, and charging batteries. Also tells how to repair batteries as well as giving the reasons for battery failure.

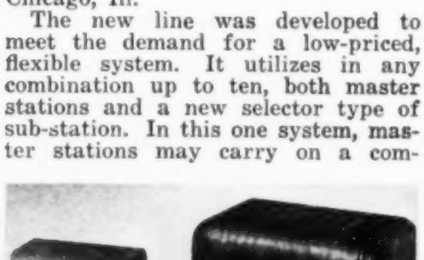
The price of the manual, in lots of 25 or less, is 25 cents per copy postpaid. Send request to The Association of American Battery Manufacturers, 2706 First Central Tower Bldg., Akron, Ohio.

•

Inter-Plant Communicator

SHOWN here are the master and sub-stations of a new line of inter-plant communication equipment, produced by The Talk-A-Phone Mfg. Co., Chicago, Ill.

The new line was developed to meet the demand for a low-priced, flexible system. It utilizes in any combination up to ten, both master stations and a new selector type of sub-station. In this one system, master stations may carry on a completely private conversation between each other, without interruption or eavesdropping by the remote stations. In addition, each may communicate with the different sub-stations at will, and may also have a private sub-station of its own.



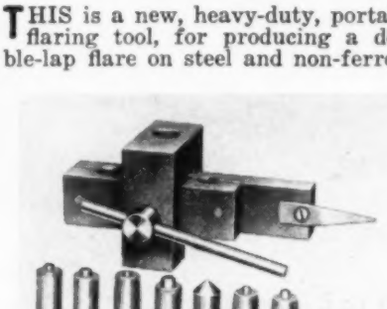
These systems may be built up progressively, beginning with two units, and then adding any number of additional ones desired. Variable volume control is adjusted at each master unit, from a whisper to full room volume. Stations can be placed at any distance up to 2,000 ft. from each other.

For 8-page catalog illustrating complete details, address The Talk-A-Phone Mfg. Co., 1219 W. Van Buren St., Chicago, Ill. . . . Mention of FLEET OWNER always helps.

•

Portable Flaring Tool

THIS is a new, heavy-duty, portable flaring tool, for producing a double-lap flare on steel and non-ferrous



tubing, from 3/16-inch to ⅝-inch outside diameter.

It is claimed that a double flare makes a stronger and more durable joint than the regular single flare, affording greater resistance to vibration fatigue and eliminating split and cracked tubes.

The new tool, called "Flaremaster", produces the 45-degree double-lap flare for SAE and inverted-flare type connections on all types of tubing, including steel, copper, aluminum, monel, etc. The tool consists of three parts—a pair of jaws, u-shaped clamp, and the die. Does not require special wrenches and can be used anywhere.

For further details address Everhot Products Co., 2055 W. Carroll Ave., Chicago 12, Ill. . . . Mention of FLEET OWNER always helps.

•

New Goodrich Fastening Device

THE "Rivnut", an internally-threaded and counterbored tubular rivet which can be headed blind, has been developed by The B. F. Goodrich Company, primarily for use as a nut plate in the attachment of De-Icers to airplanes.

With a great many other applications, both on airplanes and in other industrial fields, the company has now published a 12-page manual on the Rivnut, which is available upon request.

Complete description of the Rivnut in standard countersunk and flat-head types, and the grip range are given, as well as instructions for applying the Rivnut, two pages of charts giving all essential data, a description of both power-driven and hand tools for applying, tables on typical ultimate strength, strength in double-shear with no reinforcements, torque resistance of Rivnut keys, thread strength, shear and tension tests, and a page devoted to Rivnut weights.

For your free copy of this new manual address The B. F. Goodrich Company, Akron, Ohio.

•

Old Anti-Freeze Conditioner

A NEW chemical inhibitor for "reconditioning" last winter's anti-freeze solutions is now available. Developed by DuPont last year for the U. S. Army, it is now being released for civilian use.

The new product does not contribute to the anti-freeze properties of the old solution, but simply neutralizes any acid formation and restores the lost rust inhibitor. When treating anti-freeze with it, it is also advisable to filter the anti-freeze, to remove dirt and rust particles.

Ethylene-glycol (permanent) types of anti-freezes need reconditioning more often than the alcohol types, DuPont engineers explain, and the new inhibitor can be used in *any* type of standard anti-freeze solution. It may also be used as an anti-rust inhibitor with plain water during the summer months.

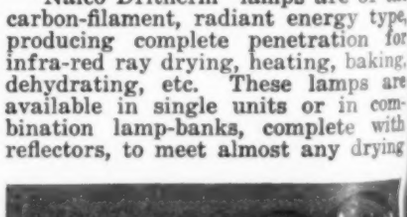
For more details regarding this product address Chemical Specialties Division, E. I. DuPont de Nemours & Co., Wilmington, Del., mentioning FLEET OWNER, please.

•

Infra-Red Ray Lamps

SHOWN here are but a few of the lamps in the complete line of heating and drying lamps produced by the North-American Electric Lamp Company, St. Louis, Mo.

"Nalco Dritherm" lamps are of the carbon-filament, radiant energy type, producing complete penetration for infra-red ray drying, heating, baking, dehydrating, etc. These lamps are available in single units or in combination lamp-banks, complete with reflectors, to meet almost any drying



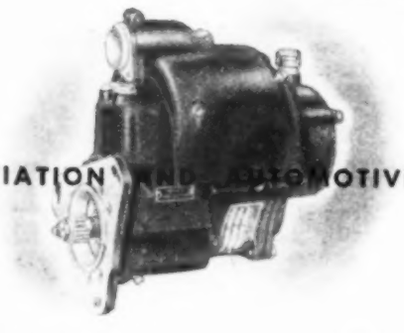
requirement. They are especially valuable in fleet paint shops.

For illustrated folders and catalog sheets showing the complete line, address North-American Electric Lamp Company, 1014 Tyler St., St. Louis, Mo. . . . You'll mention FLEET OWNER, won't you?

"SO THAT'S THE NORTH POLE!"

Soon the North Pole will need a marker — adequate identification for the post-war passengers on polar routes who'll want to tell their friends they've really seen it. Meanwhile American Bosch sticks to its war jobs — starting vibrators for positive ignition at all temperatures from equator to the arctic circle — aviation magnetos that have helped modern aircraft engines maintain service ceilings of seven miles and more — gasoline injection equipment that saves fuel, steps up pay load, increases engine performance and round trip military range. Whether the future will demand more and more production for military needs or a rapid changeover to transports for polar and other global routes, in research, design and production, American Bosch will continue to serve all branches of the internal combustion industry.

AMERICAN BOSCH CORPORATION • SPRINGFIELD, MASSACHUSETTS



AMERICAN BOSCH

AVIATION AND AUTOMOTIVE ELECTRICAL PRODUCTS • FUEL INJECTION EQUIPMENT

In the Automotive World

New Aircraft Heater Has First Showing

A NEW aircraft heater of new design was given its first public showing in New York recently by executives of Surface Combustion, Toledo, Ohio. . . . The new heater burns gasoline at any temperature down to 70 degree below zero Fahrenheit, and at any altitude, according to the makers. . . . It lights instantly and its major purposes are to de-fog, de-ice and anti-ice windshields, windows, etc., as well as to heat the plane's interior. . . . Its trade name is *"Janitrol"* and the makers expect a wide post-war usage.

•

Blackhawk Gets Army-Navy "E"

THE employees and management of Blackhawk Manufacturing Company, Milwaukee, Wis., were recently awarded the Army-Navy "E" production pennant, for excellence in war production. . . . Formal presentation was made at the main Blackhawk plant in Milwaukee, Wis.

•

Third Army-Navy "E" Star for Exide

SAID to be the first plant in the Philadelphia area to win the All-Navy "E" award in March, 1941, the makers of Exide Batteries now have the distinction of being one of the few concerns in the country to receive a third star for its Army-Navy "E" pennant. . . . The award was recently made by Admiral C. C. Bloch, Chairman of Navy Board for Production Awards.

•

Wayne Gets Army-Navy "E" Star

THE coveted Army-Navy "E" White Star for continued excellence in war production has recently been awarded to the employees of The Wayne Pump Company, Fort Wayne, Ind. . . . Wayne has been very active in war work, in addition to continuing the manufacture of air compressors and special gasoline-dispensing equipment for the Armed Forces.

•

Seiberling Gets Army-Navy "E" Star

WORKERS of the Seiberling Rubber Company, Akron, Ohio, have recently been awarded the Army-Navy "E" Star award for continued excellence in the production of war materials. . . . The award is one of the first of its kind made to an Akron area tire plant, according to J. P. Seiberling, president. . . . The "E" flag was originally presented to Seiberling on April 7, 1943.

New Standard Tire Warranty

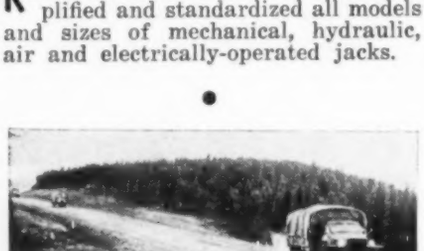
A NEW tire manufacturers' Standard Warranty has been adopted by the tire industry, due to the necessity for manufacturing tires and tubes of various materials and the need for better care of all tires now and in the future. . . . This is expected to eliminate the misunderstandings that would result if two separate warranties were in force—one for natural and one for synthetic rubber. . . . Write to Rubber Manufacturers Association, 444 Madison Ave., New York, N. Y. for a free copy if you'd like to see it.

•

WPB Standardizes Jack Models, Sizes

RECENT action of the WPB has simplified and standardized all models and sizes of mechanical, hydraulic, air and electrically-operated jacks.

•



MANY hundreds of miles of the new Alaska Highway run through virgin timber lands like this. . . . The military truck convoys now make the 1000-mile run from Dawson Creek to White Horse in about 72 hours.

•

Hastings Mfg. Co. Gets Army-Navy "E"

THE employees and management of The Hastings Manufacturing Company, Hastings, Mich., were recently awarded the Army-Navy "E" production pennant, for excellence in war production and the performance of war services. . . . Formal presentation was made at the main Hastings plant in Hastings, Mich.

•

Packard Gets Army-Navy "E" Star

FOR the second time the Army-Navy production award for meritorious service on the production front has been received by the Packard Electric Division of General Motors, Warren, Ohio. . . . The original pennant was awarded on October 7, 1942. . . . The white star for the flag was awarded a month or so ago, as a symbol of appreciation for continued and determined effort.

Use of Synthetic in Truck Tires

EXCEPT for certain over-the-road truck and bus tires, varying combinations of synthetic and from 10 to 30 percent crude rubber are being used in the manufacture of 10-ply, 7.00 tires, and on all mud and snow and standard highway 7.50 to 10.00 tires. . . . The latter tires are those used on city streets, where driving at high speed is not prevalent, and they give good service in this work, according to Goodrich engineers. . . . Up to the present time no synthetics are being used in most sizes of highway truck and bus tires which are used in high-speed, heavy-duty service, nor in many truck and bus tires over 10.50 in size, used for rock service, earth movers, logging, mud and snow tires of 18.00 and larger, nor in airplane tires of the larger sizes.

•

Lindsay Setting Up Nat'l Distribution

BELIEVING that the replacement of worn-out automotive equipment will be one of the most urgent needs of the immediate post-war period, Lindsay & Lindsay, Chicago, Ill., are now completing their national distribution set-up for Lindsay Structure truck and trailer bodies, in order to service the commercial transportation field immediately that materials are available. . . . Distribution and sale for the automotive field is under the direction of W. P. Sullivan, manager of Lindsay & Lindsay's transportation division.

•

Wilson Returns to Active Fram Duty

THE FRAM Corporation, Providence, R. I., announces that Col. Steven B. Wilson, chairman of the board of directors, has returned to active participation in the corporation. . . . Col. Wilson has served over a year in the War Department, first at Salt Lake City and later in Chicago. . . . Due to Fram's all-out production in behalf of the war effort and its increasing management problems, both the corporation and the War Department felt that Col. Wilson should return to active duty with Fram.

•

Stop Nut Output Reaches New Peak

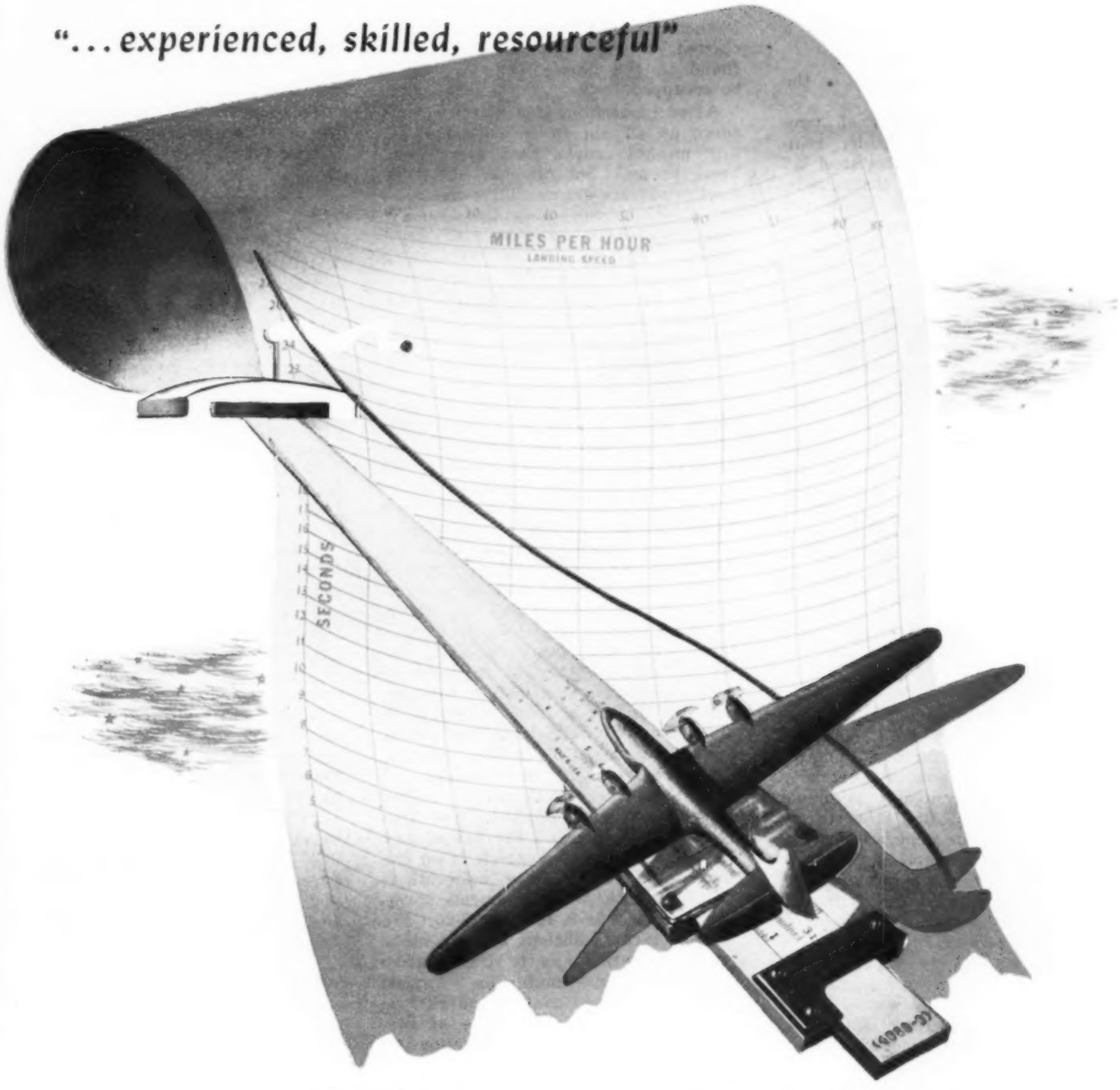
ELASTIC Stop Nut Corporation, Union, N. J., reports that self-locking stop nuts, used in great quantities by all U. S. plane makers, are now being produced at the highest rate in history. . . . The company's production for a single month, well in the hundreds of millions of units, is almost double the monthly production six months previously, and triple the rate for the same month a year ago, according to W. T. Hedlund, president.

•

May Name Highway in Honor of Heroes

PLANS are under consideration for naming sections of the Inter-American Highway, linking North America with South American capitals, in honor of heroes whose lives and deeds are associated with the areas it traverses.

"...experienced, skilled, resourceful"



Out of war's exacting demands for aircraft friction materials, are coming new and improved brake linings and clutch facings for *you*—products of a quality exemplifying that progressiveness which says, "This is America—This is Raybestos".

Experienced, skilled and resourceful, Raybestos keeps progressively ahead in every field it serves.

THE RAYBESTOS DIVISION of *Raybestos-Manhattan, Inc.*, BRIDGEPORT, CONN.

ARMY E NAVY

Raybestos

AMERICA'S BIGGEST SELLING

BRAKE LINING

YOUR 2 BEST FRIENDS for HIGHWAY SAFETY

Serving the War and Civilian Fronts with Friction Materials for Cars, Trucks, Buses, Tractors, Ships and Planes.

ODT Regulations a Boon

(*Continued from page* 58)

all tires before mounting them on the wheel.

The box is constructed of two-inch oak throughout, inside, reinforced with perforated sheet steel ¼" thick over the wood, on the outside. The entire box is then reinforced with ¼" x 2" angle-iron, welded at the ends. An opening with lockable door attached at one end, permits entry of the tire. Both wood and reinforcing are cut out on one side, sufficiently to permit inflation, yet small enough to prevent the lock-ring of the smallest size tire from passing through.

We have heard of numerous accidents where the tire either blew or the lock ring, not having been properly seated, flew off while the tire was being inflated, with serious and fatal results.

This tire inflation box shows up quite clearly in the shop picture which appears on the first page of this article. We consider it quite a safety feature.

●

How to Reclaim Valves

(*Continued from page* 62)

time. For the average garage, a pot 6" in diameter and 6" to 8" deep will be found to be satisfactory. The pot can be heated by gas or electricity, whichever is conveniently available. The source of d. c. may be a storage battery or a motor generator set. A pot of this size may clean twenty to thirty valves before a solution change is required. These figures will vary according to the size and amount of deposit on the valve.

After cleaning, the valves should be inspected. It is very important to inspect the neck of the valve for defects or fatigue cracks. Cracks are exposed best on the electrolytically-cleaned or wire-brushed valve. Grit-blasting, although doing a good cleaning job, has a tendency to cover the small cracks and, therefore, is not as suitable as the other methods.

There are several methods for the determination of cracks; these include visual inspection by the naked eye; the use of magnifying binoculars; or equipment such as Zyglo or Magnaflux.

If naked-eye inspection is used, it is best to submerge the valves in gasoline and then dust with chalk. The most dangerous cracks will become visible, although minute cracks may remain undetected. The use of binoculars ranging from 7 to 14 power is fair for this work, but again, minute cracks can be easily overlooked.

The Zyglo or Magnaflux methods are good but are not generally available to the average garage or fleet. Magnaflux is very good for ferritic valves, but cannot be used for austenitic valves.

We recommend that all valves be subjected to one of the suggested methods before any repair work is started. If any signs of cracks are found in the valve neck, it should be scrapped.

After inspection, shot-blasting will serve as an aid to cover and close any minute cracks that may have been present but undetected. This work also hardens and increases tensile strength. Shot-blasting is highly recommended, if available.

Repair Methods: After inspection, the valves are ready for repair operations. In the case of Group I, the seat and tip need only regrinding and the valve is ready for use. This type of repair is common to everyone, so no further discussion is required.

Group II valves which require metal added to the seat present a greater problem. First, the valve is prepared for the application of metal by grinding a groove or recess in the seat area. This recess may be formed as illustrated in Figure 3, depending on the equipment available and the design of the valve. Generally speaking, we recommend a minimum thickness of metal of 1/32" and may go up to ⅛" thickness or more. As a rule, the heavier the coating applied, the more skill and care is required to make a sound weld. It is common practice in the valve industry to manufacture original-equipment valves faced with stellite ranging from 1/32" to 1/16" in thickness.

Figure 4 shows Group II valves with hard-facing applied. For this group we recommend the use of any hard-facing material which is on the market. If hard-facing material is not available, we recommend stainless weld rod 18-8, 19-9 or 25-20. We have not run sufficient tests to make recommendations as to the relative merits of these materials. Anyone interested should contact the various manufacturers of this type of material and get detailed instructions on its use.

Figure 5 shows the Group II valves completely finished, ready for re-use. This picture illustrates several valves that have had their under-section of the head and part of the radius cleaned up by grinding. This grinding operation is not absolutely necessary. For appearance sake it is recommended; from an operation standpoint they will work just as well without it; so this is left to the discretion of the operator; it will depend largely on the availability of equipment for the operation.

The type of repair as shown in Group II valves, although not too common, is used to good advantage by some fleet operators. It is definitely *more expensive* than using new valves. We might add that the largest percentage of valves discarded fall into this group. Therefore, this operation, if carried out on a large scale, would give considerable relief to the demand for replacement valves.

(*Editor's Note:* There's more to this interesting article on valve reclamation. In our next issue we will present the balance, which offers detailed data on how to properly reclaim the valves in Group III to V inclusive. Also the author's conclusions regarding the practicability of this wartime subject. . . . You'll be looking for it, won't you?—*H.C.F.*)

●

Post-War Diesels

(*Continued from page* 70)

permitting the ship to make its catch and return to port. The installation of a new engine would be the matter of an overnight job.

In one of the Navy's vessels, a twin-screw job, four engines have been combined onto a single shaft, making eight engines in all on the twin screws. This vessel can be operated with any combination of from one to eight engines. This is not an isolated, experimental vessel. Hundreds have been turned out and are being turned out."

Indicating the growth of Diesel production, Mr. Dickson cited the fact that whereas the total Diesel production in America in 1940 was four and a half million horsepower, more than fifteen million horsepower of one small series American Diesel engine alone was produced in 1941, 42 and 43. He also cited the increase in horsepower, without increase in weight or size of this same engine, from 165 horsepower before the war to 225 horsepower today.

"This same engine," he said, "has developed in laboratory tests over 300 horsepower, while Diesel engineers can visualize the prospect of 450 horsepower without depending on the increase of speed as a sole factor for this same size of engine."

Touching on the familiar subject of the resistance to today's faster speed engines by those whose previous knowledge of Diesels is confined to the old slow-speed, heavy engines, Mr. Dickson pointed to the greater reliability records of the faster speed engines in gruelling war experience and then cited the fact that the term "high-speed" in connection with such engines is only relative. It is purely a question of design. Actually, he said, the fastest run Diesels of today have only about half the shaft speed of the ordinary gasoline automobile engine and are not by any means up to the speeds which we can expect in Diesels in a few years.

The speaker admitted that with only the knowledge of a few years ago available, the bearing surface speed of 80 feet per second which occurs on one Diesel engine today would have appeared impossible. However, that was before engine users knew that "the higher the speed a shaft operates in a bearing, the better able the bearing is to sustain high loads without detriment to itself. So, in post-war power, I feel people will lose the inherent fear that the term 'high-speed' appears to arouse."

Mr. Dickson disclosed that during experimental work in the General

HERE'S THE CAP THAT DOES THE JOB

This Schrader cap, costing a few cents, protects a $50.00 tire and tube assembly. It and its millions of brothers are protecting billions of pounds of rubber. Use them, don't lose them! A Schrader cap, finger tight, guarantees an airtight valve.

Schrader

CONTROLS THE AIR

ARMY E NAVY

A Tip from a Life Vest to..

A skillful blending of rubber and fabric—inflated with carbon dioxide—the precious gas retained by a Schrader valve. That's a modern life vest. Simple? Yes. But it's a strong grip on life to a man in the sea. Schrader valves are dependable. You can depend on them too.

UNDERINFLATION "EATS UP" TIRES

The tire shortage is serious. Underinflation robs your tires of many miles of wear—breaks down the side walls and destroys the tubes. And here's something to remember—you can't recap a tube or a broken side wall.

PREVENT THAT UNDERINFLATION

Use a Schrader gauge to tell you whether your tires are properly inflated. Maintain that pressure by seeing that every valve is equipped with a Schrader airtight cap, screwed down finger tight, for although a valve core may be slightly worn, a Schrader cap *guarantees* an *airtight valve.*

If the next checking of your pressure shows an abnormal loss in any one tire, you know the leak is in the tube itself. Have that tire changed at once. Prevent underinflation and save your tires.

SCHRADER PRODUCTS HELP SAVE RUBBER

Replaceable Tire Valves • Valve Cores • Air Sealing Valve Caps • Air Chucks • Valve Repair Tools • Pencil Type Gauges • Service Gauges • Airline Couplers • Vulcanizers

A. **SCHRADER'S SON,** *Division of Scovill Manufacturing Company, Incorporated,* **BROOKLYN, NEW YORK**

Motors Diesel Laboratory to determine what might be done if Diesel-operated war vehicles were caught somewhere without standard Diesel fuel oil available, it has been determined that gasoline, when injected under very high pressure, burns *later* in the Diesel cylinder than fuel oil.

"We know that the gasoline engine has a compression-ratio of say 5 to 6-to-1, whereas the Diesel engine has a ratio of 16-to-1, and that as we advance beyond 6-to-1 in the gasoline engine, anti-knock properties have been added to the gasoline to permit operation at high compression-ratios. However, it has been found possible to inject gasoline in exactly the same manner as Diesel fuel is injected in the Diesel engine; that is, into a 16-to-1 compression ratio, and obtain a normal operating engine both as regards sound and performance.

"As a matter of fact, when the gasoline is injected into the hot air of the combustion space, ignition of the gasoline takes place *slower* than when Diesel fuel is injected. This is contrary to what many might have expected. Knowing gasoline to be such a volatile fuel, they visualized that the injection of gasoline into a 16-to-1 compression-ratio would blow the heads off, but this is not so. Ordnance vehicles have been constructed and operated with two tanks, one containing gasoline and the other one Diesel fuel, so that by turning a valve in the operator's compartment, the Diesel engine would operate upon either gasoline or Diesel fuel."

Mr. Dickson said that the records of these experiments showed that whereas the same gasoline burned in a gasoline engine would give ten miles per gallon, it would give 14 miles in the experimental vehicle in the Diesel engine, as compared with 16 miles to the gallon obtained by the use of regular Diesel fuel.

"Some of you," he added, "may feel that you would like to have me tell you when we will have Diesel engines in our automobiles. Well, that answer I cannot give. However, here is a development which would have immense practical value if and when there is a transitory period from the gasoline-operated automobile to the Diesel-operated automobile. Now do not misquote me. Note I said, 'if and when,' because there are many major factors to be overcome in its accomplishment.

However, imagine yourself confronted with the prospects of buying a Diesel engine operated automobile. One of the first questions that would come to your mind would be: 'How would I be able to drive up to a gas station and obtain Diesel fuel?' Well, the automobile salesman, when that day comes, will be able to advise you that if you cannot get Diesel fuel, then just put gasoline in the tank and you will obtain greater mileage per gallon than if you had purchased an automobile with the normal gasoline carburetor engine. Of course, you can realize that there are more BTU's per gallon of Diesel fuel than in a gallon of gasoline, therefore the Diesel fuel would be what you would prefer.

"Another point that would be of interest in the filling of your tank would be that you would find that the lower the octane rating of the gasoline, the better would your automobile Diesel engine like it."

●

Brake Drum Reconditioning

(*Continued from page* 66)

tion of the brake track and the third was the difference in the rate of wear of the friction blocks.

A pair of sprayed metal reclaimed brake drums was also installed on a GMC light delivery truck and used in the service of a well-known brake station in New York. One was sprayed with a carbon-free iron and the other with a steel containing 25 percent carbon. The installation was made in July, 1942. In November, 1943 the drums were inspected after 11,000 miles of service and found to be in excellent condition. While it would be premature to base a conclusion on a single installation, it is indicative that reclaiming brake drums for light or medium equipment is not a particularly critical job when the proper method of preparation is used.

The Motor Wheel Laboratory at Lansing, Mich., tested seven drums reclaimed by metal spraying. Three drums were done in accordance with a newly-developed metallizing method, as past experience had shown that older metallizing methods resulted in failures in bond between the sprayed coatings and the drums. For example, a drum reclaimed with a high chromium alloy (the older method) scored badly, as well as developing many small heat checks. A test of a drum done by the newer method showed no scoring, but many fine heat checks. The method of testing and the friction materials were identical in all of these tests. The lining used is known as a non-scoring material containing atomized lead as an ingredient. Considerable differences in performance and results were noted in several of the other drums tested. It is possible that a difference in technique or heat of spraying may explain such differences.

Another drum was tested at Motor Wheel's laboratory, in which the base metal of the drum was first treated with a spray coating of copper, before applying the 80 percent carbon iron wearing surface. This copper under-coat was tried for two reasons. First, to eliminate any tendency to form a heat dam at the point of bond between the base drum metal and the sprayed metal surface. Second, to present a ductile film between the base metal and the sprayed metal. After testing, it was noted that there appeared to be less serious heat-checking, the islands were larger and the cracks not so wide or deep as in drums treated without the copper under-coat.

The Johns-Manville laboratory at Manville, N. J., also tested a metal-sprayed, reconditioned brake drum. Heat checks developed early in their tests, with the usual result of rapid brake lining wear, and the test was discontinued.

All of these laboratory tests have, of necessity, been abusive in order to more quickly develop the condition found and to reduce the necessary time for testing. At each stop, for example, there was absorbed in these brake drums one-half million foot-pounds of energy.

The committee offers the following pertinent conclusions with regard to brake drum reconditioning in general:

(1) That at the present time, the only reclamation process which holds promise of success, is the metal-spraying process.

(2) That the use of higher carbon content iron is more satisfactory for this purpose than the carbon-free, or extremely low carbon iron.

(3) That for light and medium-duty service, reclaimed drums are, to all practical purposes, as satisfactory as new drums.

(4) That an undercoat of copper does tend to eliminate a heat dam between the base metal of the drum and the new sprayed surface.

(5) That the method of metallizing, as recommended by the committee, should be used. This method is not too critical nor too difficult for the average shop to perform successfully.

(6) That the cost of reclaiming brake drums is approximately the same or slightly less than the cost of new drums.

(7) That if new drums become scarcer, this process will not only be an economic possibility, but an absolute necessity.

(8) That it may be within the realm of possibility that future perfection of technique and development of alloy spray metals will produce superior wearing brake drums.

The committee does not believe that, in the short space of time that it has been probing the problem, that the last word in either type of face metal or technique of application has been achieved. Therefore, much more time and many more trials must be expended on this problem. The indications are that higher carbon content may be advantageous and that the addition of free graphitic carbon should be tried.

●

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A FURTHER decline of about $5,000,000 in state highway revenues, if gasoline restrictions are continued for another year, is expected by the Virginia State Highway Department.

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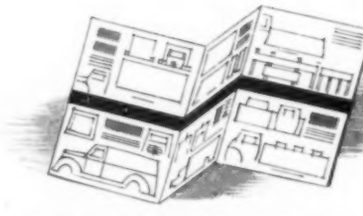

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Visualizer contains outline diagrams of body types, cabs, rear doors, tops, visors, side panels, etc., for sketching and arranging trademarks, lettering, etc. Also includes important data describing the most effective use of the free advertising space on your trucks. Address requests to Department Dept. 31-2.

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BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

Surveys Fire Extinguisher Use by Police

POLICE vehicles equipped with fire extinguishers account for the disposal of 1.62 fires apiece per year, it is indicated in a recent survey by Safety Research Institute, New York. Of 216 police departments which responded to the survey, 109, or about half, report that they equip a total of 729 vehicles with fire extinguishers. Not all departments keep such records, but 391 vehicles for which records are maintained accounted for 634 fires during 1943.

From the comments made by those participating in the survey, it appears that few of the fires extinguished are in the vehicles carrying the equipment; apparently the fires are almost always in the property of others; most frequently in automobiles.

The distribution of fire extinguishers is as follows: 69.9 percent on patrol cars; 14.3 percent on motorcycles; and more than 3 percent each on ambulances, passenger-cars and patrol wagons. Vaporizing-liquid fire extinguishers make up 74.2 percent of the equipment; carbon dioxide, 11.5 percent; and unidentified, 11.4 percent.

The survey covers 26 departments in cities with over 100,000 population; 29 departments in cities of 50,000 to 100,000; 46 departments in cities of 25,000 to 50,000; 91 departments in cities of 10,000 to 25,000; and 24 departments in cities having less than 10,000 population.

The percentage of fire extinguisher-equipped police vehicles is highest in the larger cities, and in those located in the East, West Coast area and New England.

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RIGHT, Pete! Millions of precision parts have to be made exclusively for war engines. Millions of other parts—replacements for original parts—must be made, carefully packaged, identified, and sent to all battle fronts of the world.

That's the number one job of Thompson Products. But the maintenance of cars, trucks, buses, and tractors in America, and in other of the United Nations, is also mighty essential to the war effort. That's why the ingenuity and skill of automotive repairmen are so important.

Thus far, we are keeping a considerable volume (as much as in many pre-war years) of the parts you need, going to T. P. Jobbers. We urge that you conserve them, use them wisely, only when really needed, and installed where they will do the most good.

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In this Emergency Make More Use of Your TP Jobber's Machine Shop Facilities.

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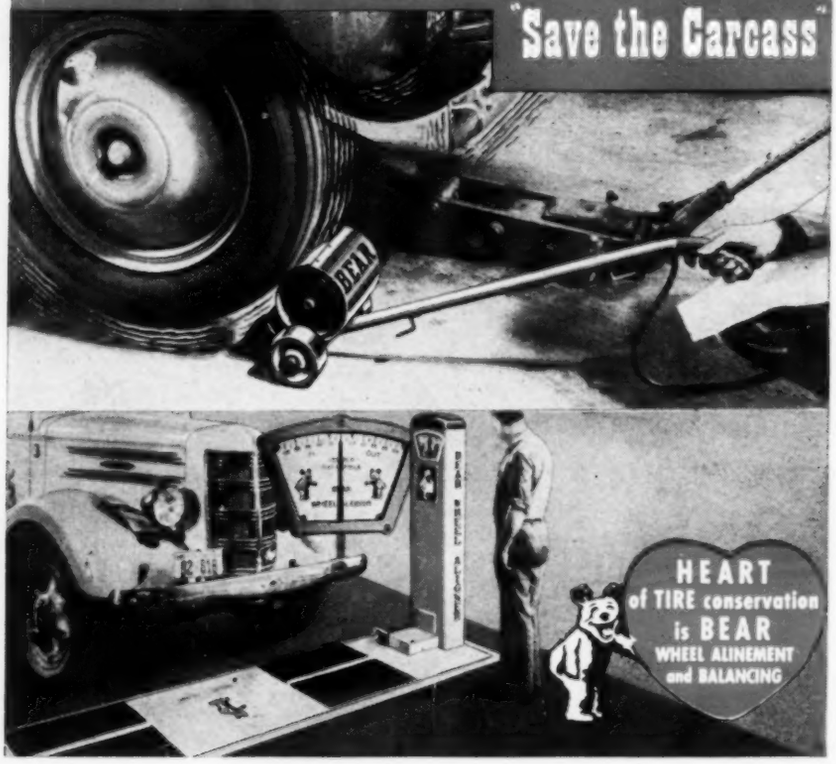
Two Quick Tests

that will help you do your Full Part in the campaign to

"Save the Carcass"



Help conserve Millions of Tires. Join in the SAVE THE CARCASS Campaign. Make these 2 quick, easy tests on the tires of every truck in your shop:—

1 CHECK *Dy-Namic* WHEEL BALANCE with BEAR SHIMMY DETECTOR

Shows Dy-Namic UNbalance in a Jiffy! Simply jack up the truck, shove Bear Shimmy Detector under wheel, and "rev" her up to about 35. That front end and whole body vibrating and shimmying shows how UNbalanced wheels pound the life out of tires and steering parts. Then after wheel has been Dy-Namically Balanced, use Bear Shimmy Detector as a check. If vibration is absent, work has been done right.

2 CHECK WHEEL ALINEMENT with BEAR ALINEMENT Tester

Takes half-a-minute. Just drive truck over platform—Read Dial—That's All! Easy-to-read figures indicate front and rear wheel misalinement, and side-slip or drag per mile; even shows up bent rear-axle housing. Proves wheels are out of alinement, wasting tires, wasting parts—risking life. Enables you to make quick, correct toe-in adjustments on all cars and trucks.

Send questions to BEAR MFG. CO., Dept. FO, Rock Island, Ill.

BEAR

Alinement Testers · Wheel Straighteners · Dy-Namic Balancers
Wheel Aligners · Frame & Axle Straighteners · Shimmy Detectors

Post-War Truck Survey

(*Continued from page* 60)

by inadequate size for the current carried, it will in time reach the same stage of failure by ageing.

There are also instrument-panels which are hinged for maintenance accessibility to wiring and instruments. Here again, the wires are not secured and arranged properly to prevent the accidental pinching of one of the wires on reclosing the panel section. A short-circuit from such pinching is the usual result of an otherwise completed repair job. The proper fastening of wires to the chassis running to the rear of the truck, in many types of units, leaves much room for improvement.

As stated above, it is the contention of many operators that the wiring on a truck should be designed and installed with the view of lasting the life of the unit, and towards this end it is the earnest desire of operators to have at least the following points considered in the post-war truck:—(1) Wire size to be adequate for the load carried. (2) Better workmanship installation; and, where a number of wires are together, have them bound or placed in conduit or loom. (3) Better insulation with non-inflammable characteristics. (4) More liberal use of fuses and fuse-blocks of good construction. (5) Firm and positive junction points. (6) Wiring running to rear of unit be well supported with good clips. (7) Stronger and well-designed electrical switches.

The interesting part of this discussion is that all of the above requested items have been available on the market and we, like others, did procure *quality* electrical items to replace the original inferior quality of the parts as installed by the manufacturer, after the trucks had been in service for a relatively short time.

Oil Filters: The oil filter has become a standard accessory in most automotive equipment and as such there are two points that might be worthy of consideration: (1) Oil filter base to be an integral part of/or mounted directly on the cylinder-block. This would eliminate to a large degree the use of external connections. (2) Since oil filtration on most present-day oil filters is directly related to temperature, the use of a jacketed filter, whereby use is made of the engine cooling system liquid to elevate filter temperatures, appears to have merit for consideration.

Engine Valves: The accessibility to engine valve maintenance seems to be centered around, first, the location of the engine in respect to cab or chassis; and, secondly, to the general use of cylinder-heads as a mounting place for miscellaneous accessories. Fortunately, most engines give a fairly creditable valve operating performance to help reduce the periodic checking or replacement of valves. The proper functioning of valves and their condition must be maintained if the engine is going to perform the work it has been designed to do. The importance of engine valves, therefore, dictates that their accessibility be kept within reasonable limits, consistent with the general chassis design, and the avoidance of using the engine head as a mounting place for miscellaneous accessories.

Unit Replacement: We now come to the matter of unit replacement and our survey of fleet operators on this question, worded to cover primarily ease of engine replacement in the chassis, resulted in two classifications of replies: (1) The medium and heavy-duty truck operators, as a general rule, indicated their desire to

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PENNSYLVANIA REFINING COMPANY
BUTLER, PENNSYLVANIA

Let 35 years of "know how" help you keep your runs on schedule

There are only four kinds of spark plug trouble,—wear, dirt, incorrect gap, and broken insulation. Through thirty-five years of experience, AC engineering and manufacturing have *developed specific remedies.*

Abnormal wear, and excessive fouling, are cured by correctly applying the AC Heat Range to the operating conditions of each engine. A "colder" plug remedies too rapid wear, and preignition. A "hotter" plug cures excessive fouling. Dirt can be thoroughly removed, and gaps accurately set, with the AC Cleaning Machine and AC gapping tools.

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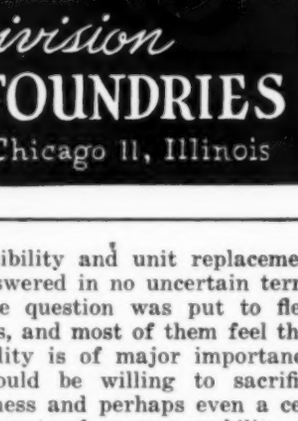
Every ASF *Safety 5th* Wheel is tested under controlled conditions before it is mounted upon your truck-tractor.

Starting with high pressure the jaw locking assembly is worked back and forth until a smooth, positive coupling action is attained.



WRITE FOR A 5th WHEEL CATALOG:

Automotive Division
AMERICAN STEEL FOUNDRIES
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have the power plant more easily removable from the chassis. They cited that at least one item covering engine removal would aid the problem, that being, to have certain connections of water, air, oil, or fuel easily broken and re-attached. (2) The light truck operators went on record to the effect that engine removal in this truck classification is not generally practiced and see no reason for any major redesign to permit accomplishing this feature. Of course, they would not object if the design were incorporated to make it quite easy to remove the power-plant if it could be done without extra cost.

Accessibility and unit replacement were answered in no uncertain terms when the question was put to fleet operators, and most of them feel that accessibility is of major importance. They would be willing to sacrifice compactness and perhaps even a certain amount of maneuverability in order to gain ease of repair. This is particularly important when we consider the high cost of labor now prevailing and when we realize that this high labor cost per hour will probably remain after peace has been declared.

In line with this, easily-removable units may permit a unit repair system which will prove both economical from a repair standpoint and effective in keeping equipment on the highway a maximum period of time and in the shop a minimum.

It might be worthy to note that the repair system of the Army is based upon unit replacement and overhaul, and we can feel sure that, as a direct result of this method of teaching, the newer mechanics in the trucking industry will be *unit-conscious*.

Cold-Weather Starting: The post-war truck should benefit by the design and performance of automotive equipment as developed for the strenuous job of waging warfare. For example, in cold-weather operation, the starting and warming-up of equipment, under severe conditions, is aided by some form of heating device which functions while the equipment is parked or stored for any appreciable period at low temperatures. For the most part, truck operation in this country is not subject to 20 to 40 degrees below zero; nevertheless even relatively mild weather of 0° or +10°F creates a considerable problem in starting and warming-up for the average truck parked outdoors, or in an unheated garage.

The ease of starting a cold engine is affected by many variables, such as, fuel, temperature, oil, electrical system, battery and mechanical condition of the engine. Although fleet operators were not unanimous in asking for some type of coolant or crankcase oil heater, the majority felt that some form or type of heating to be advisable. . . . Quoting from a large fleet operator, "Some type of temperature control for oil and/or coolant is very desirable. For winter, this could take the form of an electric heater that could be plugged in a lighting

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system when the truck is not in use."

The advantages of quick starting and warming-up are reflected in decreased wear, decreased general maintenance costs and saving in fuel. The problem of starting and warming-up may be attacked from other angles; however, the purpose of this section of the paper is to indicate that a cold-weather starting problem *does* exist and should be added to the list of items "the fleet operator desires improved in post-war trucks."

Rust-Proofing: Rust-proofing of exposed under-metal parts, including inside of cab door panels, etc., was generally accepted as a desirable item, though again not unanimously. Here again with divided opinion, those favoring rust-proofing were quite emphatic on the subject even to the extent of willingness to pay extra to secure it. With a large percentage of our own fleet retained over a rather long operating period before replacement, we see economic justification in rust-proofing. No doubt those operators who can justify operating equipment over a rather long time period can justify rust-proofing to eliminate expensive replacement of those parts rusted through.

In line with this type of conservation, mention should be made of untreated wood used in cab construction, which degenerates into a powder form after an extended period of operation. This type of maintenance, involving either rebuilding the cab or replacing same, should not be contingent on the matter of structural wood failure, as this source of trouble can be so easily overcome by using treated wood.

Truck Cabs: This now leads us to a discussion of truck cabs on which practically all fleet and truck operators had considerable to say. Better cab vision is essential, and most truck cabs could be improved in this respect. Even in engine-under-seat jobs, where vision should be at its best, the designer has not sufficient glass, or has placed posts and framework at an undesirable location. An improved cab with improved accessory installation is important to driver comfort. A large driver cannot properly act in emergencies when squeezed into some of today's cabs. Windshield defrosters, cab heaters, flare containers, fire extinguishers, boxes for driver's records, etc., are all standard and necessary equipment today and should be designed and built-in the cab as integral units.

A typical reply from an operator will be used here as representative of thoughts on this question. "A lot of safety could be built into the present cabs that are full of blind spots, cramp the driver and generally encourage driver fatigue. Windshields should be high enough for a reasonably tall driver to see out of without having to keep his head ducked down on his chest. Seats should be adjustable so that both the short and tall men can reach the controls and still be able to sit in a comfortable position. Built-in windshield defrosting

Says G. T. W. Alabama . . .

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Washing trucks and trailers with Speed Wash gets amazing results with little effort and great speed. Clean, fresh water feeds right through the handle and tufts, so that each 12 inch stroke does a complete job of soaking, scrubbing and rinsing. There's no waste motion changing tools and back-tracking over the same surface. You can see how this easily cuts washing work and time in half, does a better job, and also saves the finish.

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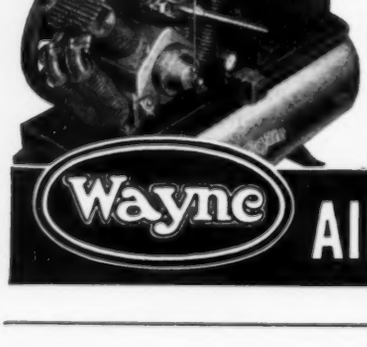

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Wayne AIR COMPRESSORS

and cleaning is definitely a must."

There has been a general standardization of the location of the foot-pedals, which should be continued. However, the hand-brake type and location does differ considerably in various cab designs. There is need for a standard hand-brake lever, easily reached. It should be mounted in a standard position and operated by pulling back. On some trucks the hand-brake requires pulling up on the lever to set the brake. This is awkward and difficult, which lends itself to having a runaway truck.

Most cabs of today could be roomier and permit easier entrance and exit. It appears that where the manufacturer had to stay within certain legal unit overall lengths, he increased body length at the expense of the cab. In this respect, it should be mentioned here that more uniformity in state regulations would aid the manufacturer in designing vehicles that can be used universally. No doubt the lifting of restrictions by some states for the duration will help in bringing about more uniformity in regulations after the war.

Wide doors in many cab designs lend themselves to getting in and out of cabs easily and, in multi-stop type of delivery units, a number of operators favor the step-in type of cab entrance.

Improving the comfort of the driver in the cab also entails better sealing around doors and pedals, insulation of the cab roof for summer heat and exclusion of engine fumes and heat from the cab. In some models, cab parts directly over the engine exhaust line get quite hot, in fact too hot to touch; this added cab heat may be welcomed in winter but condemned quite emphatically by the driver in the summer. Seals around the door are a function of winter comfort, and some operators have had sponge rubber sealing fastened to the door with glue that had a rather short operating history. Where this rubber came loose or disintegrated, the draft in the cab during cold weather was quite disagreeable. The manufacturer subsequently improved the situation by applying weather-stripping by another more positive means.

The sealing of *passenger-car interiors* from heat, cold, fumes, noise, together with comfort details, certainly indicated the necessary thought that was given by the manufacturer to the problem, and it is hoped that the truck cab in the future will be guided by such accomplishments.

Cab hardware, on the other hand, appears to be one item borrowed from standard passenger-car design and construction which is simply not sturdy enough for the truck cab. Here again, on the multi-stop and also on other type operations, the frequency of use of door handles, latches, controls, etc., dictated hardware construction in keeping with the severity to which it is put to use.

Finally, before leaving the subject of cabs, there are operations requiring certain treatment and design; for example, power-take-offs and controls, which should be built-in and not hooked up after the purchase of the unit. Utilities and some over-the-road operations require larger capacity cabs, i.e., five or seven-man cabs for crew members and, in the latter operation, sleeper accommodation, and these operators indicate that better accessibility is desired, particularly on the c.o.e. units.

Bumpers: One of the main functions of bumpers (excluding decorative types) is to minimize or to prevent damage to the vehicle to which they are attached. It is certainly desirable

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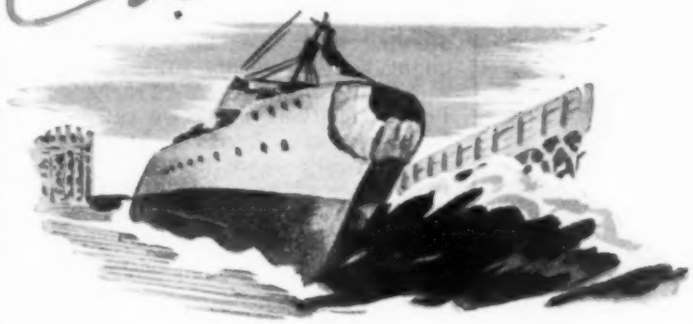

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AHEAD OF SCHEDULE

Beating the schedule has become routine performance in American shipyards. But even before the keel is laid and every day up to the time of launching vast amounts of materials must be in the "yards"—on time from many and widely scattered sources.

Motor truck transportation plays a vital role in the swift movements of goods "on schedule"—and great fleets of FWD trucks are engaged in this important service of supply for ship construction.

Wherever trucks have important work to do, FWD'S are delivering the dependable performance needed today. They are fully qualified to meet every demand for sustained and difficult performance — to haul more tonnage—cover more miles—at less cost per ton-mile. The full power and grip of four driving wheels provide extra grade-climbing ability under full load — capacity to get through under adverse weather and road conditions — full four-wheel powered traction that enables truck and driver to do far more than what is usually expected.

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The Oldest and Original Exclusive Builders of Four-Wheel-Drive Trucks

BELOW: FWD in service at a prominent shipyard — expediting the handling and moving of heavy marine equipment as well as maintaining yard roads. This truck is equipped with dump body, under body blade and snow-plow.

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that, where a collision involves two vehicles equipped with bumpers, contact be made *between* the bumpers. In this respect, a survey of bumper heights reveals a closer standard height of front bumpers than rear bumpers, which is obvious, considering the various types and construction of bodies. Without attempting to designate any standard dimensions, suffice to say that the advisability of installing substantial bumpers at heights to give the greatest coverage for the number and types of vehicles on the highway, is worthy of consideration.

Miscellaneous: The installation of fancy grille work, decorative bright metal, etc., is not too favorably received by the truck operators, for the simple reason that it serves no useful function and, as a matter of beauty, it loses its appeal once the unit has left the showroom floor. What the operator desires is good sturdy construction, which in itself can be made quite pleasing to the eye without resorting to excess decoration. Eye appeal in the attempt to make some type of trucks look big, gives the operator no greater payload privilege and usually results in a cab design leaving much to be desired in comfort and accessibility. It appears that the operators are not requesting the fancy treatment of the units, so that restrictions to its use should not be missed.

Trucks and Public Relations: Before drawing this paper to conclusion, it might be appropriate to say a few words at this time on "Trucks and Public Relations." As we raise our sights to new horizons for future truck operations, we cannot ignore the importance of greater public acceptance to the truck on the streets and highways. The first objectionable item from this standpoint is noise; and I am not referring to the vehicle signal system.

I think it would do well for the designers to consider methods for reducing the noises from exhaust, gears, wheels, tires, etc., that are so prevalent on the present-day truck. May we not ask ourselves the question, "Are not some of these negative conditions as attached to the trucking industry one of the underlying causes of closed routes, no Sunday operation, etc."? No doubt the general public reactions to the inconsideration of the trucking industry are natural and growing. I might cite the introduction of the new type of street cars which made their appearance in many of our cities as a good example of what can be done by design in reducing noise plus, of course, greater speed, safety and comfort and which have certainly gained public acceptance and better public relationship for the traction operators. I believe that the matter warrants real consideration by the entire trucking industry and a challenge that will surely be accepted and met.

•

How the Army Tests Tires

(*Continued from page* 64)

running 10,000 miles without failure.

Since February 1943, small Army tires have been 100 percent synthetic. They are doing an outstanding job, as is certified by the following comment from D. G. Roos of Willys-Overland, based on tests his company ran with 100 percent synthetic tires, size 6.00-16: "*The wear on synthetic tires is no greater than on tires made of crude rubber. The synthetics seem in every way equivalent to the rubber tires.*" It is felt that these tests

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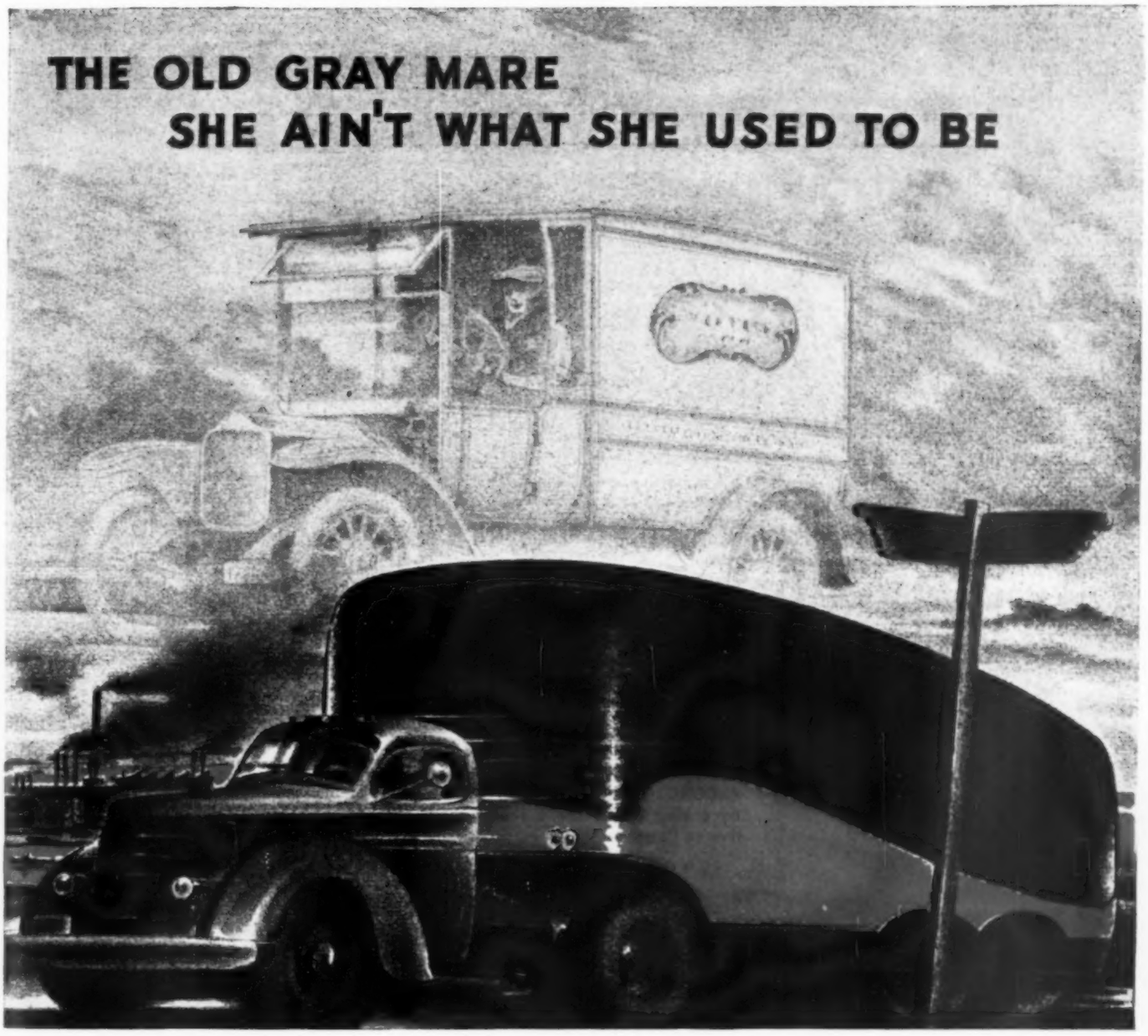
MOTOR-MILE TACHOMETER
1831 Diversey Parkway, Chicago



When horsepower quit the traces to move in under the hood, the change was scarcely greater than the difference between modern cars and their cousins of the 1920's and '30's.

As motor performance improved, Wolf's Head kept abreast of changing engine designs, and paralleled each development with oils and lubes to match the new needs. Today, it has created a distinctly *new* oil specifically to meet the challenge of wartime's severe operating conditions.

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Is a Wartime Economy

of small size tires should remove any serious questions about synthetics from the minds of fleet owners who are operating large groups of passenger-cars or light trucks. It has been rumored that synthetic car tires cannot be driven over 35 mph, and that they will not give adequate mileage. The factual data which the Army has derived under test conditions more severe than civilians should drive, prove that this is not true. Army Ordnance has bought over a million of such tires and so far has had no complaints from the troops using them.

Medium Tires: This group consumes about 70 percent of all the rubber in the Army's pneumatic tires. It is probably also the most important group to fleets, since the tire sizes involved — 7.00 through 10.00 — are those used on big highway fleets, as well as in most city or short-haul work. We ran our first tests on these in May 1942, using synthetic treads and received quite a shock. Tested at 35 mph, sustained speed, 20 percent overload per tire, on 10 percent gravel roads, resulted in a severe cracking condition. The same tires on cross-country runs developed severe chipping and cracking at very early mileage, some as early as 3,000 to 6,000 miles. These tires demonstrated a principal weakness of synthetic tires—lower resistance of the tread to cutting, chipping and cracking. The poor tearing resistance indicated that once a slight cut or crack started, it progresses rapidly. . . . Resistance to chipping and cracking has, however, been greatly improved by work done by industry chemists. Later synthetic tires, tested under the same conditions, were neither chipped nor cracked as badly as the previous group, when examined at 10,000 to 18,000 miles.

The Army's tire testing procedure established two new problems to be overcome in the use of synthetic rubber: (a) Heat type failures, experienced in long-haul supply type operations. (b) Bruise or shock breaks in the carcass, due to striking rocks or other obstructions in cross-country tactical type operations.

An extensive series of development programs was then directed at heat failures and very effective results have been obtained. It was found that by placing a slight amount of natural rubber in the breaker region and last plies, which is the part developing the highest temperature, more resistance to heat was gained. Special measures have been taken to resist bruise blowouts, including the use of extra reinforcing plies extending across the crown of the tire —called "cap plies"—the use of rayon instead of cotton cords, and the use of better compounds. These have given sufficient improvement to indicate that synthetic tread *and* carcass tires will provide mileage closely comparable to natural rubber tires in normal military service.

All of the Army's medium size tires are now being produced with synthetic treads and carcasses. Tread wear has not been a major factor and Army figures show that synthetic treads have as good wear-resistance as the war quality natural and reclaim treads, and are in many phases superior for wear. It should be explained that 90 percent synthetic is the highest that the Army plans to use in the near future, and that 10 percent or more of crude rubber is necessary to give adequate service in these truck tires.

Large Tires: The largest tires, sizes 11.00 through 14.00, represent the most severe problem, since they are

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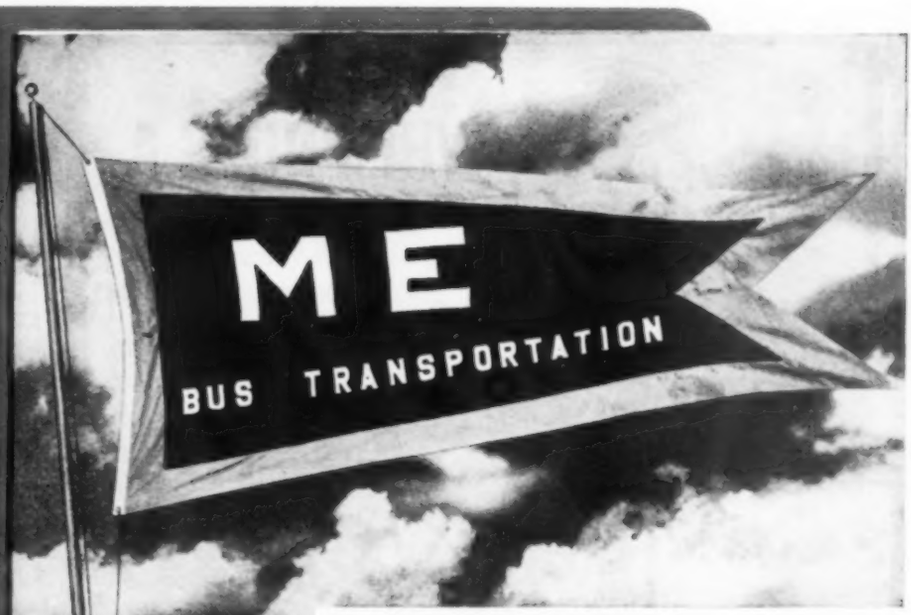

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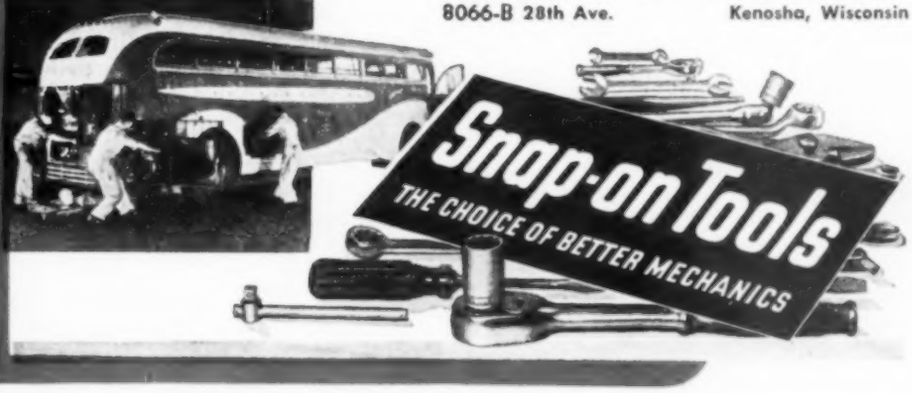

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thicker and heavier and are considerably overloaded on some Army and Transportation Corps vehicles. Test programs are in progress which show favorable results, but which are not sufficiently conclusive to indicate final constructions that the Army will use. This includes tests of large earth-mover tires, up to 21.00-24 sizes, used by the Army Corps of Engineers.

This large tire size group is not of general interest to fleet owners, since few road vehicles use such sizes, and their volume in Army requirements is small compared to the previous groups. Accordingly, no detailed discussion was made of this group.

Tubes: At first the work on synthetic tubes was discouraging. Early samples split along the tire bead line, separated at the splice, pulled away at the valve-patch and chafed when used in drop-center rims or with bead-locks.

A separate Committee of tube technicians was set up and special test trucks were provided so that tube failures could be segregated from casing failures. Tubes of GR-S synthetic were worked out which, when applied to rims with flaps, resulted in an average mileage of 17,000 and have been run to 30,000 miles without failure.

Tubes made of GR-I, Butyl synthetic rubber were found to present no such major problems as GR-S and averages of better than 20,000 miles were obtained with Butyl tubes. At present, the Army is accepting military tubes of GR-S synthetic in sizes 6.00 through 9.00 for all wheel diameters when applied on rims using flaps.

Although synthetic rubber tubes are not as good as natural tubes, it is evident that with reasonable care on application and keeping inflation up to standard, also keeping within the specified speed limit, they will give satisfactory service.

Repair and Recapping: A problem concurrent with the production of adequate military synthetic tires and tubes is that of recapping and repairing. As a direct result of the Ordnance-Industry development program, all camelback used to racap the bulk of the Army and civilian tires is 100 per cent synthetic and doing a good job.

Repairing with synthetic is a tougher problem than recapping, and has reached a stage where repair materials now use a blend which includes 25 percent synthetic rubber. Repairing of synthetic tubes has presented a tricky problem. Ordinary hot or cold patches which are standard in the field have not been fully effective on synthetics to date. To repair a synthetic tube properly, it is recommended that a professional repair on a hot-plate be made. The heat should be confined to within the temperature range of 285° to 310°F. When a repaired synthetic tube is subjected to higher heat, the repair quickly begins to crack at the joint and continues to crack until there is a leak at the edge of the re-

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The Fleet Reliner's Manual can be invaluable to you in training new mechanics. It will also be a big help to all mechanics in guiding them toward quicker, more efficient servicing, resulting in safer braking and fewer lay-ups for your fleet.

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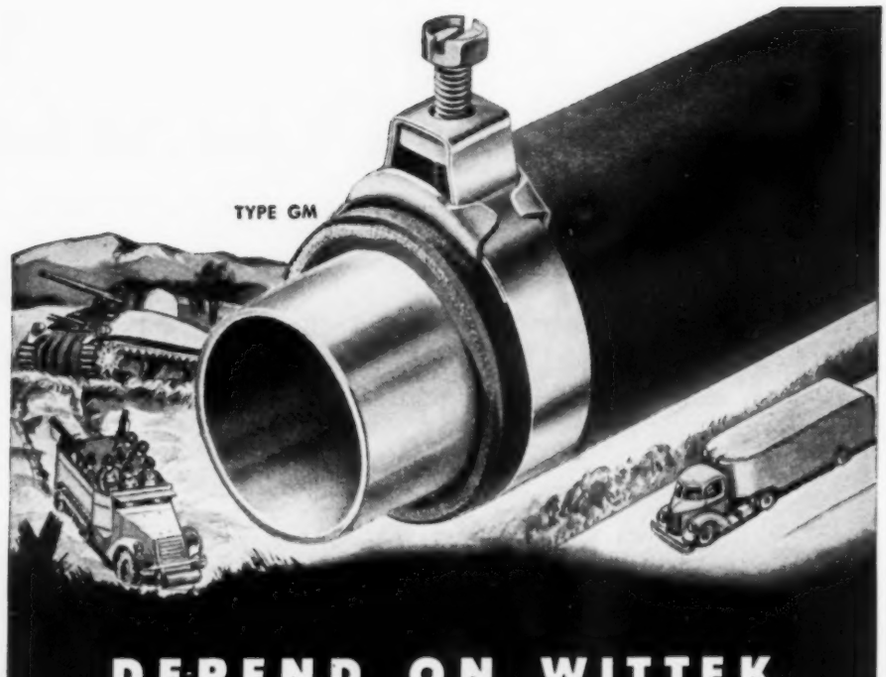

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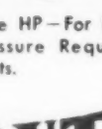

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pair. On the low temperature side, adhesion is not satisfactory below 285°F.

Synthetic tubes are more sluggish and less elastic than those made from natural rubber. Therefore in repairing synthetic tubes with natural rubber, or with a blend of rubber and synthetic, the vulcanized repair gum should have as near as possible the same modulus of elasticity as the tube itself. For example, ordinary rubber tube repair gum is not as good as tread repair gum, because the latter is stiffer and has more nearly the same elasticity characteristics as a synthetic tube. Rapid improvement has been made in compounding and repairing of synthetic tubes so that the service received from repaired tubes is fast becoming more satisfactory.

Conclusions: From this data and discussion, you will see that a great amount of development has been done on synthetic rubber. The question is: "What Can Fleet Operators Learn From This Work?"

The first thing is that certain fundamental problems which originally appeared extremely difficult, have now been solved through intensive Ordnance-Industry development. If some of your first tires do not live up to expectations, do not jump to the conclusion that synthetic tires are fundamentally bad. If Ordnance had quit because its first synthetic tires were unsatisfactory, neither you nor the Army would have been farther expanded and synthetic tires would not be in production.

The second thing is that synthetic tires, to do a good job, must be properly used. For most types of trucking they will give adequate service. There is one class of service where they may give trouble—the long, sustained, high-speed intercity runs during hot summer months. As an exaple, tires on a recent test averaged 4,954 miles at 20 per cent overload. The same tires at 10 percent underload were all still running at 10,000 miles. These were run on long, hot runs similar to the most severe trucking operations. This tendency becomes more critical at the higher overload. You cannot abuse them by severe overloading, and this will be forcefully driven home to some operators by epidemics of heat blowouts. The remedy is to get sufficient tire capacity on your trucks to carry the load, and to give them the best maintenance.

The third thing we feel you can learn, perhaps the most important, is that the Army has every confidence in synthetic tires. This confidence is based on factual data from severe tests, plus the experience of hundreds of thousands of tires in service, extended well over a year. Understand clearly that we do not claim synthetic tires are equal to natural rubber tires, because they definitely are *not as good.* The gap between the two is steadily decreasing however, and the tire industry is making a tremendous

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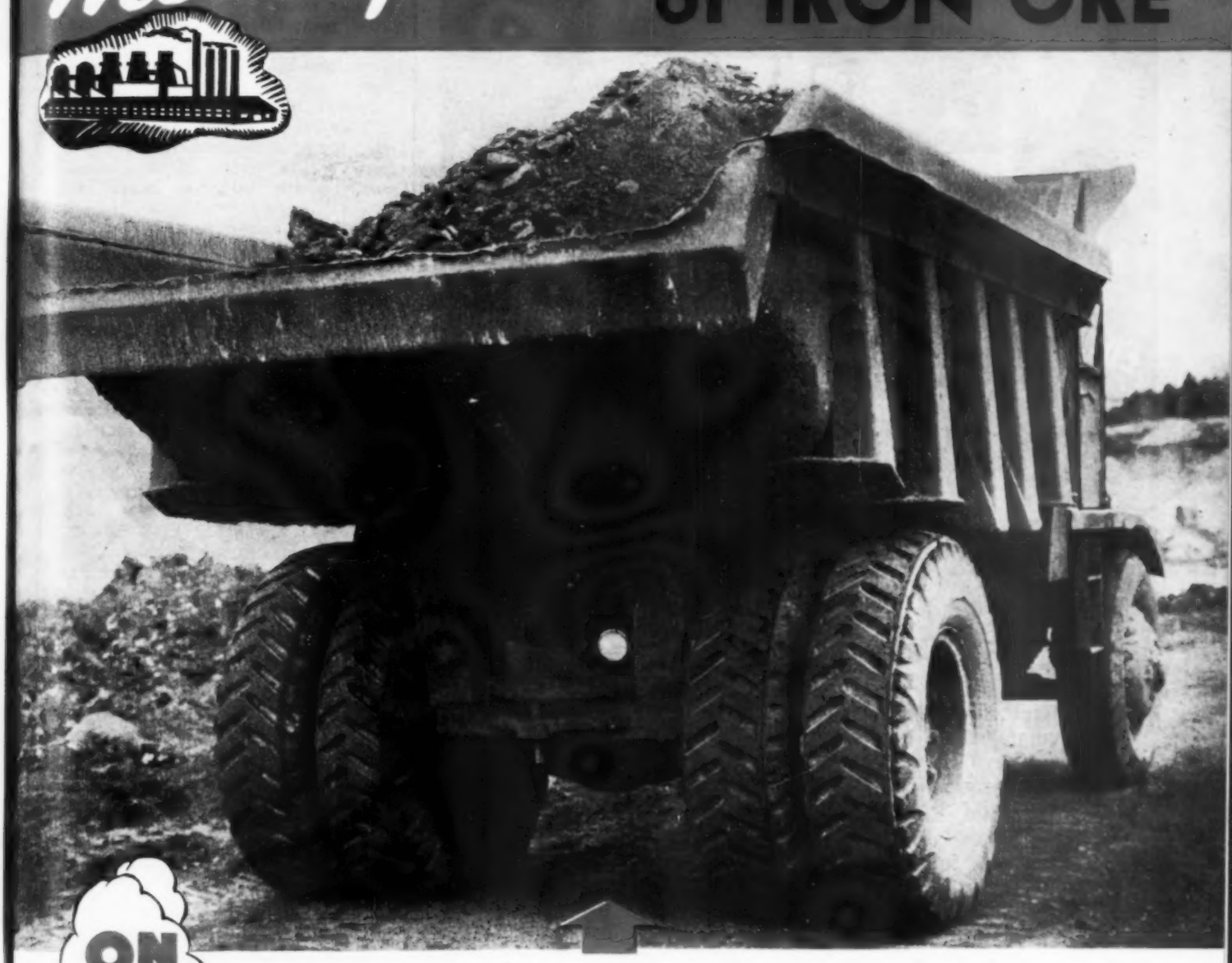

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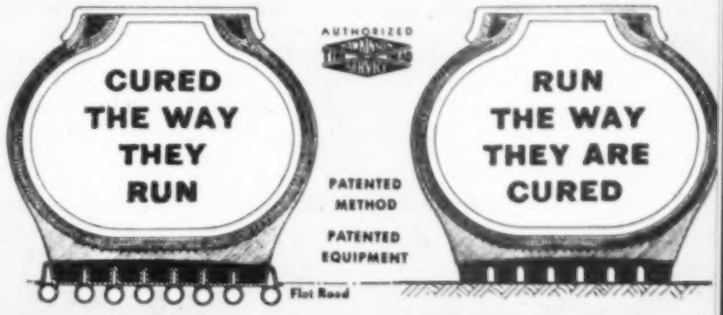

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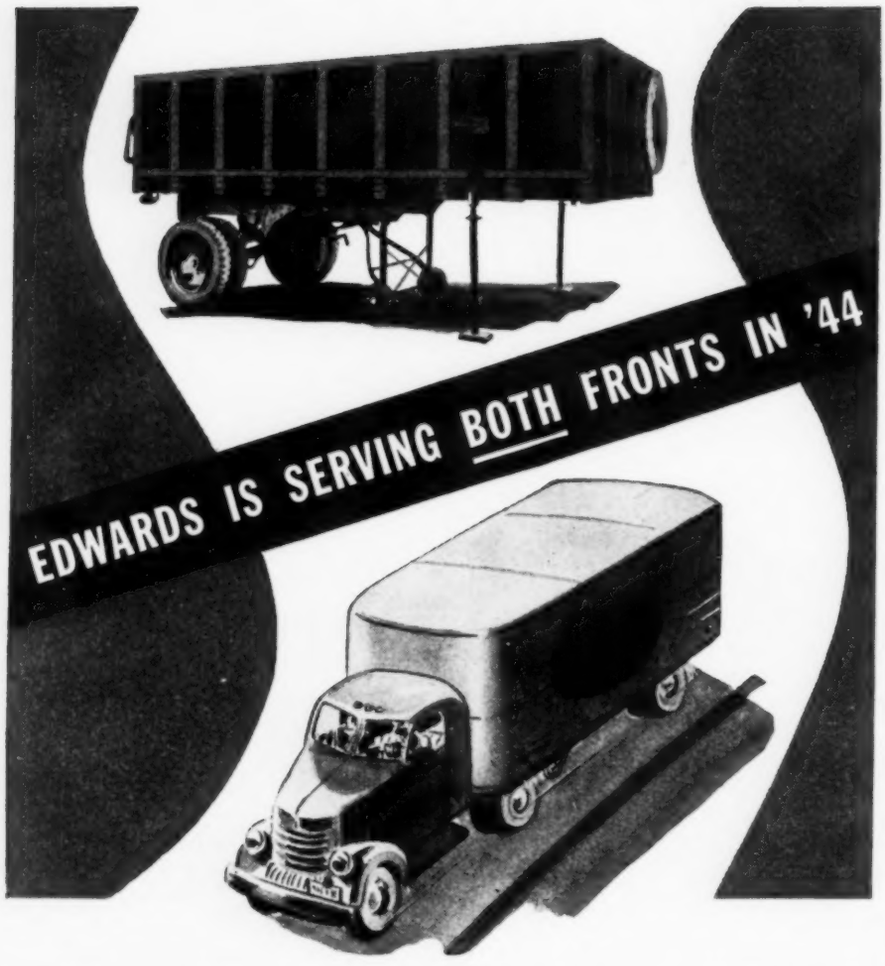

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effort to eliminate this difference completely. We hope, however, the fact that the Army is so thoroughly sold on synthetic tires, will give fleet operators and truck engineers confidence and help to dispel some of the doubts that have been expressed.

●

Post-War Fuels & Cars

(*Continued from page* 68)

that the net effect of the aviation gasoline program will be to permit an increase of from two to three octane numbers, on the average, over immediate pre-war levels. This estimate, of course, assumes that lead usage will not vary appreciably over that prevailing before the war.

"The automobile and petroleum industries have never been able to stray very far from the fundamental basis of the maximum number of car miles obtainable from a barrel of crude, at the same time complying with acceptable standards of performance.

"By and large, it appears that about 85-octane, as expressed by the ASTM procedure, represents the highest knock rating which can be used effectively by automobiles to be available in the immediate post-war period.

"The writers therefore hazard the guess that in the first post-war year or so, motor gasoline will rapidly approach octane levels of about 85 for premium and around 80 for the regular trade."

In recapitulating his paper Mr. Brown reached a number of conclusions, among which were the following:

"*First*, 100-octane aviation gasoline is now being made to the maximum capacity of the industry, without regard to the economics of operating cost, transportation, or crude utilization.

"*Second*, under peace-time conditions, the amount of such gasoline to be required must, of course, be but a fraction of wartime requirements.

"*Third*, the net result is that immediately after the war, a substantial portion of our emergency aviation gasoline manufacturing facilities will be discharged from war duty, and those which can be economically operated will be turned to the manufacture of motor gasoline for which they will run under conditions chosen for economy rather than maximum octane-number.

"*Fourth*, these and the other factors concerned in this discussion seem to indicate that immediately after the war we can expect that the average octane-number level of motor gasoline may increase as much as three units over immediate pre-war values and that the majority of the marketers will be able to offer house-brand products at around 80-octane number, and premium products of, say, 85-octane number.

"In conclusion, it is not intended that the foregoing be interpreted as indicating that 100-octane motor gas-

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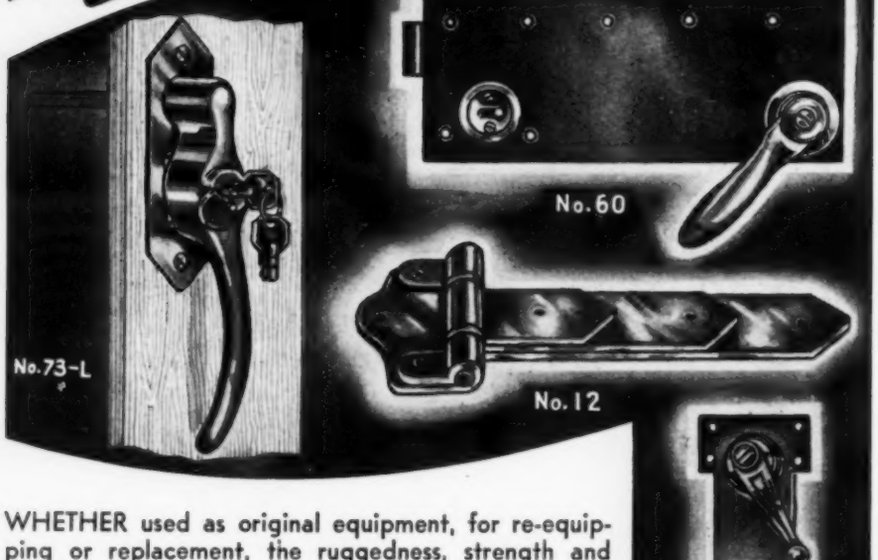

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oline will *never* be feasible as an automobile fuel. Rather, the picture appears to be that immediately after the war, the foregoing improvements are definitely practical with succeeding improvements possible but requiring equipment design, development, and construction. In other words, improvements much above the indicated levels will be 'evolutionary rather than revolutionary'."

Charles A. Chayne, Chief Engineer of Buick Motor Division, presented a paper on "The Utilization of Post-war Fuels."

Mr. Chayne made one cogent point in saying, "With all respect to Mr. Brown, I cannot avoid recalling to you the number of times people have said that automobile development has reached the end of the road and that no finer cars could be built—then—sure enough—a year or two later some important change came along and we were off to a fresh start. I use the words 'important change' in the engineering and not in the advertising sense."

One of the most significant statements on the utilization of high-octane motor fuels during the entire evening was Mr. Chayne's remark that:—

"I think I am safe in making the statement that, as of today, no one knows how to make a 100-octane fuel engine that is 'sweet' enough to try to sell to a car buyer."

He also agreed that sooner or later we would have to succumb to the designs set forth by the stylists or "Airbrush engineers" with:—

"Now—if the stylists convince the public that they want shorter hoods—you know what will happen—no matter how difficult a trick it may be—they'll get shorter hoods. To fight it would be just as futile as trying to get feminine hats on a rational basis.

"Regardless of how light weight is obtained, it will mean less work for the engine and consequently, less fuel consumption.

"I can assure you, however, that we will do our best to be ready by the time high-octane fuel reaches the filling stations."

In the prepared discussions, J. F. M. Taylor, vice-president of Shell Oil Co., said that he agreed with the statements in Mr. Brown's and Mr. Barnard's paper, although he was not in complete agreement with some of Mr. Chayne's ideas on fuels.

He stated that, in the long run, the fuel demand would be set by the automobile manufacturers and that the refiners would produce the fuel that the industry requires.

According to Mr. Taylor, the economy question was primarily one of miles per barrel of crude rather than miles per gallon of gasoline. He raised several significant questions on energy consumption in motor vehicles.

One was that passenger-cars get 10 ton-miles per gallon of fuel, against up to 100 ton-miles per gallon for transcontinental buses.

Mr. Chayne partly explained this

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UNLESS YOU READ THE TIRE WARRANTY, THERE'S

DANGER AHEAD

Take a good look, Mr. Fleet Owner, at that tire warranty you get with your new tires. Take a second look, in fact, at that line which reads "we do not warrant such tire or tube when it has been used on rims not conforming to Tire and Rim Association standards." Then, if you're the patriotic kind we think you are (as well as doubtful of getting all the new tires you need) do a bit of checking to make certain your tires are riding on bases of adequate width.

What is the best width of rim? The National Wheel and Rim Association has proved beyond a shadow of doubt that hundreds of thousands of extra tire miles could be secured if tires all were mounted on rims or wheels having bases one size larger than generally considered as standard. This is the wide-base principle which, in actual practice on some of the nation's largest fleets, has shown increases of from 20 per cent to 50 per cent in tire mileage.

Why didn't someone think of this before? They did. Some farming equipment has used this principle for years. But there was plenty of rubber. Everyone really got his money's worth from a set of tires. Now it's a case of getting every last fraction of a mile from them. And wide-base rims or wheels can help you do just that.

When you next get new tires, remember to read the warranty. Avoid the danger of ruining precious rubber. Take time, too, for asking about wide-base rims and wheels. Use them in this emergency, with both new and old tires, and you'll continue to use them for postwar economy.

National Wheel & Rim Association
3315 Locust Boulevard St. Louis 3, Mo.

WHAT IS CORRECT? *If you're in doubt about rim sizes to use on your vehicles for greatest tire mileage, get this free book. Tells the story of wide-base rims and wheels. Ask your wheel and rim distributor, or write direct to the Association.*

WIDE-BASE RIMS AND WHEELS

a Yankee was a Hero then . .

General Sam Houston had the stuff heroes are made of! Outnumbered almost ten to one, Houston began a strategic retreat — followed by the enemy who had spread their lines thinly. Waiting until the enemy got careless, Houston and his band of Texans charged the Mexicans with the cry of "Remember the Alamo!" A surprised enemy, expecting to cross a stream on a log bridge which already had been wrecked, was overwhelmed and destroyed. So Texas was saved, to later become a part of the United States.

★

TODAY'S HERO IS A YANKEE TOO!

TRADE MARK REG. U. S. PAT. OFF.

To be heroes today, TELESCOPIC ADJUSTABLE MIRRORS too, must have unbeatable heroic qualities. They must stand the "gaff" by day and work the night shift too. They must emerge from the day's work unbeaten and unbowed. They must serve each vehicle loyally, long, and must repay your original investment many times over.

FUNDAMENTAL QUALITIES LIKE THESE DISTINGUISH YANKEE TELESCOPIC ADJUSTABLE MIRRORS AMONG ALL OTHERS!

Fundamental qualities like these make Yankee MIRRORS, Reflectors as well as Stop and Tail Lamps, Directional Signals, Marker and Identification lights, preferred on every fighting front, both here and abroad!

NO. 245 TELESCOPIC ADJUSTABLE MIRROR

Features an adjustable hinge clamp which fits hinges of any truck on the road (1-¾ inches to 2-⅜ inches). Telescopic feature allows up to 27-¾ inches extension. An additional bracket is furnished for body mounting.

Manufactured in accordance with regulations contained in WPB Order L-158 governing production of automotive replacement parts

YANKEE METAL PRODUCTS CORP.
NORWALK, CONN., U.S.A.

FOR *Distinguished* SERVICE

YANKEE
AUTOMOTIVE AND AVIATION MIRRORS REFLECTORS LAMPS AND SAFETY DEVICES

☆ ASK YOUR JOBBER OR WRITE DIRECT FOR PRICES AND DETAILED DESCRIPTIVE LITERATURE ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆

as due to inherent operating conditions in the automobile, but agreed that better transmissions and weight reduction of passenger-cars would give considerably better results.

Mr. Taylor concluded with the statement that when an efficient automobile transmission is built to take better advantage of fuels, it will be time to consider higher-octane fuels.

In a further discussion from the passenger-car engine builder's standpoint, Max Roensch, staff engineer of Chrysler Motors, made some rather significant statements in his discussion.

He said that competition brought higher-octane fuels and also brought car improvements.

According to Mr. Roensch, there are two methods of obtaining economy. One is in modifying the engine design to take high-octane fuels. The second is the use of supercharging.

He indicated that an increase in fuel ratings will be dictated very largely by economic factors and stressed the need for close cooperation between the automobile and the petroleum industry in ultimately working out fuel and engine problems.

Dr. W. J. Sweeney of the Research Division of Ethyl Laboratories, read Mr. Robert Russel's discussion on both papers.

Mr. Russel stated that Mr. Brown's octane figures were not nearly as low as they appeared, as they represented about 90 *road* octane.

•

Heavy-Duty Engine Oils

(*Continued from page* 78)

parently to the dispersive action of heavy-duty engine oils.

Oil Reclaiming: The additives in heavy-duty detergent oils are consumed in service by resisting oxidation, dispersing contaminants and maintaining engine parts in a clean condition. Therefore when the oil is drained, the amount of these additives used up depends on engine operating conditions and maintenance practice. When these drainings are subjected to the drastic treatments of oil reclaiming units involving heating to high temperatures, the remaining additive is used up in combating the effect of these high temperatures.

Reclaimed oil, therefore, more nearly becomes a straight mineral oil, the quality of which is dependent on the base stock used in its original manufacture and the efficiency of the reclaiming process. Addition of a commercial additive to a reclaimed oil offers the difficulty that the additive would not be compatible with the oil because the balance of inhibitors in most inhibited oils has been worked out to a fine degree by the oil refiner. In addition there is no assurance without engine testing that the newly compounded oil will be of proper quality.

Centrifuging: Heavy-duty detergent

KEEP YOUR VEHICLES MOVING ECONOMICALLY with HALL VALVE SERVICING EQUIPMENT

Ask Your Jobber or write
THE HALL MFG. CO.
TOLEDO, OHIO

MORE THAN STRAINS

Actually Cleanses Oil!
DELUXE Oil Filters
MORE THAN FILTERS
DE LUXE PRODUCTS CORP., LA PORTE, IND.

YOUR TRUCK CAN *stop* IN TIME... EVERY TIME!

WITH THE VACDRAULIC Brake Power Booster

However weary a driver may be, he should always be able to stop instantly. He can do so with a Vacdraulic Booster, because with it he can brake even the heaviest truck with passenger car ease.

Utilizing a new principle of operation, this extremely simple unit multiplies many times the braking power of any hydraulic system. Small, compact and self-contained, it can readily be installed anywhere along the hydraulic line. It has no rods, links or lever connections with the brake pedal to be damaged or to get out of adjustment.

The driver always gets the proper "feel" from the brake pedal, and the brake action is simultaneous with the pedal movement, both in its application and in its release. The amplifying effect comes in so evenly that the braking action is always smooth. When the engine is not running the hydraulic brake works in the usual way.

The simplicity of design and construction of the Vacdraulic Booster assures maximum service with a minimum of maintenance.

TO REPLACE OLD EQUIPMENT

The Vacdraulic Booster does not have to be built into the structure of a truck, but at any time can easily be installed at a convenient point in the hydraulic system, with a simple connection to the intake manifold.

This ease of installation particularly adapts it for the replacement of worn or obsolete booster equipment.

While the Empire plants are fully engaged in war production, Vacdraulic Brake Power Boosters are available for new installations or replacements within the limits of W.P.B. regulations.

ENGINEERING DATA WILL BE FURNISHED ON REQUEST

ELECTRIC EMPIRE BRAKE CO.

South 14th Street — Newark 7, New Jersey

Manufacturers of MAGDRAULIC ELECTRIC BRAKE • VACDRAULIC BRAKE POWER BOOSTER AND EMPIRE STEERING BOOSTER AND STABILIZER

Action!

when you need it

with **MILEY'S**

Better Brake Materials

MILEY'S *faster service* is growing more important every day! No longer can trucks, cars and busses lie idle waiting for repair parts . . . and that's why the special emphasis Miley places on *faster delivery* is appreciated more than ever today!

Fleet owners and operators on whose shoulders rest the transportation and shipping problems of this war have come to depend on MILEY for brake materials, unlined brake shoes, lined shoes, clutch facings and brake cylinders because today, fleets *must* be kept rolling!

Ask for Miley "BLACK GOLD" and Miley "EBONITE"

Standards for better lining as well as faster service!

L. J. Miley Company, Inc. 1060 W. Adams Street Chicago 7, Ill.

oils can be used in engines equipped with centrifugal oil purifiers. However, this method of oil purification is less effective than other methods, due to the highly dispersive characteristics of the oil. The practice of water washing in conjunction with the centrifuge should be discontinued, due to the adverse effect that water has on these oils.

Used Oil Analyses: Some of the conventional tests employed in the testing of used samples of straight mineral oils and ordinary motor oils are not applicable to oils of the heavy-duty detergent type.

For example, the test for precipitation number which involves centrifuging the oil at high speed and measuring by volume the amount of foreign material thrown out, gives a fictitiously high value due to the excellent dispersive action of these oils. This dispersion prevents the finely dispersed particles from forming a compact sediment as a result of the centrifugal action and a higher value is thereby observed.

In the copper strip corrosion test, many of these oils give a dark, tarnished appearance to the copper strip, characteristic of the protective coating they give to copper-lead bearings. This appearance defies the detection of corrosive tendencies by the usual visual observation and nullifies the importance of this test.

Neutralization number test as determined by the usual ASTM method gives fictitious results with oils containing certain types of additives which react to the chemicals used in this test.

High ash value reflects the presence of metallo-organic compounds used as detergent additives in the oil and hence do not necessarily indicate only foreign mineral matter contamination.

Recommended Uses: Heavy-duty detergent oils were specifically designed and are recommended for all high-speed engines, both gasoline and Diesel types. Many medium-speed Diesels equipped with a single lubrication system are using these oils where improved ring lubrication is desired. They are also suitable for

MAREMONT

DEPENDABLE SINCE 1877

MAREMONT AUTOMOTIVE PRODUCTS INC.
SOUTH ASHLAND AVENUE AT 17th STREET, CHICAGO, ILLINOIS

THE
ALMETAL
UNIVERSAL JOINT
POWER TAKEOFF DRIVE

ALMETAL Joints for Industrial and Automotive applications are helping to produce essential material and move wartime loads.

THE ALMETAL UNIVERSAL JOINT CO.
1555 EAST 55th STREET · CLEVELAND 3, OHIO

for Safety's Sake

DO-RAY SAFETY LIGHTING and EQUIPMENT

DO-RAY Tested by RECOGNIZED TESTING LABORATORIES, PASSING SPECIFICATIONS OF S.A.E. AND I.E.S. MEETING REQUIREMENTS OF I.C.C. CERTIFIED PRODUCT

SAFER LIGHT SAFER SIGHT

DO-RAY LAMP COMPANY
1358 S. MICHIGAN AVE. · CHICAGO

West Coast Highway Gets WPB Approval

WPB approval for the immediate completion of the Idaho-Oregon-Nevada highway is expected to be of tremendous importance to Idaho farmers in marketing their products.

The project, all in Oregon, near the Nevada line, provides for new construction on 13 miles and resurfacing of an additional 47 miles.

It extends northward from Scotts Butte, Oregon, near the Nevada border in the vicinity of Jordan Valley, and will provide a more direct route between Idaho and Oregon production centers for transportation of food supplies and war equipment to California points.

---

the cylinder lubrication of large low-speed engines requiring greater protection against ring sticking or wear.

The successful performance of these oils in high-speed engines has naturally led to many attempts to use them elsewhere. Experience has shown however, that some caution must be exercised when extending the use of oils of this type.

Although heavy-duty detergent oils are often used for the lubrication of cylinders in large, slow-speed Diesel engines, their use in the separately lubricated crankcase is limited by the oil purification equipment employed. The greater dispersion and emulsification properties of these oils tend to prevent satisfactory removal of carbonaceous material and water, making it necessary to drain the crankcase oil at regular intervals in order to remove these contaminants.

This procedure, although particularly desirable for the smaller high-speed engines, is far too expensive and time-consuming where crankcase capacities of large engines range as high as 1500 gallons. In such installations a straight mineral oil is used to better advantage in that it can be maintained in a relatively clean condition almost indefinitely. This is accomplished by the purification system's removal of contaminants as rapidly as they are formed.

Where heavy-duty detergent oils are used in these large engines, special precautions must be taken where water-cooled pistons, mechanical lubricators and centrifuges are employed.

(Editor's Note: This excellent, non-technical article on modern, heavy-duty, detergent-type oils, has been abstracted from a 20-page booklet recently issued by The Texas Company, . . . In addition to the foregoing material, the booklet ably illustrates and describes various laboratory and road tests which have been made with these types of oils. . . . Fleet operators may obtain complete copies by writing to The Texas Company, 135 E. 42nd St., New York 17, N. Y. . . . Ask for *"Lubrication"*, Vol. 29, No. 11 and mention FLEET OWNER, if you don't mind.—*H.C.F.)*

YOU CAN REPAIR Synthetic RUBBER TUBES WITH YOUR DILLECTRIC

COMPLETE INSTRUCTION MANUAL *Free!*

Pictures and describes in detail the proper preparation of tube injuries for repair and safe, permanent vulcanization.

Request a copy, today!

Vital Information for All Fleet Operators

Special attention is necessary in the repair of synthetic rubber inner tubes for tires. Synthetic rubber has less tear resistance than natural rubber and injury usually results in a tear instead of merely a puncture. This makes proper reinforcement and vulcanization of every repair a vital requirement to prevent repair failure.

Utilizing present equipment and supplies, exhaustive tests by Dill engineers have proved the Dillectric method of tube repairing performs equally well on either synthetic or natural rubber. Full instructions will be sent to you on request. You can depend on Dillectric. It's the safe, trouble-free method for all your tube repairs.

THE DILL MANUFACTURING COMPANY
700 East 82nd St., Cleveland, Ohio

DILLECTRIC *Electrically* VULCANIZED TUBE REPAIRS

Demand these labels when buying uniforms

ARMY TWILL by REEVES SANFORIZED* MADE TO GOVERNMENT SPECIFICATIONS

REEVES Glengarrie POPLIN

UNIFORMS OF REEVES ARMY TWILL SCORE A HIT!

In our "all out" war effort, long-wearing serviceable uniforms help to maintain transportation efficiency. So specify *Reeves* famous fabrics for *your* next uniforms.

REEVES ARMY TWILL meets exacting U. S. Government Tests for better wear, longer life, and color-fastness. Its fabric vitality keeps it "in shape" under trying conditions.

Specify GLENGARRIE POPLIN for matching shirts. It's a durable, stylish fabric in a wide range of colors. Both fabrics Sanforized* against shrinking.

*Fabric shrinkage not more than 1% (U.S. Government Test CCC-T-191-a)

See your nearest dealer for uniforms, sport and work clothes made from these famous fabrics, or write for colorful leaflet to:

OVER 6050 million yards of Reeves Army Twill sold to the U. S. Army

REEVES BROTHERS, INC.

54 WORTH STREET NEW YORK CITY

Most Auto Dealers Keep Doors Open

DESPITE dire predictions of the fate of motor vehicle dealers when the manufacture of civilian automobiles was halted in 1942, it is estimated that 83 out of every 100 dealers in business on December 1, 1941 still have their doors open.

LITTLE GIANT

AUTOMOTIVE TRUCK EQUIPMENT

TEN WHEELERS

for 1½ to 5 Ton Trucks

Greater tonnage . . . more profit. Increase carrying capacity up to 20 tons. Extend frame to any desired length. Load kept in perfect balance . . . no teeter or end-sway. Simple, sturdy, no intricate parts. Timken bearings; steel castings hydraulic brakes. Easily installed in 3 hours. 3 sizes. *LOW COST. No priority rating required.*

Also makers Little Giant Frame Extensions, Hand Hoists, Wrecking Cranes.

Write for Circulars, Low Prices

LITTLE GIANT PRODUCTS, INC.

1535 No. Adams Peoria, Illinois

Studebaker Manual is "Best-Seller"

WITHIN a month after its publication, Studebaker's newest training manual, entitled *"The ABC's of Automobile Construction and Design"*, is already in the "best-seller" class, according to vice-president K. B. Elliott. . . . The book was issued as part of a long-range program of considerable scope, designed to facilitate the training of service and maintenance personnel in the automotive field.

•

Fisk Tire Appoints Richtmyer

THE FISK Tire Division of U. S. Rubber Company announces the appointment of A. G. Richtmyer as manager of its sales analysis department. . . . He has been with Fisk since 1936 and served in 1941 and 1942, on a leave of absence, with the OPA and WPB in Washington.

VALVOLINE "X-18" Gear Lube

For ALL Automotive Gears All Purpose

Valvoline Oil Company, 579 East Fifth Street Cincinnati, Ohio - Refinery in Pennsylvania

Usner Elected Ross Gear President

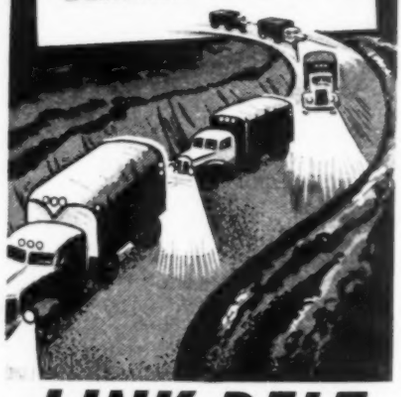
THE ROSS Gear & Tool Company, Lafayette, Ind., announces the election of Edward L. Usner as president, succeeding Eugene Gruenewald, whose untimely death occurred October 1st last. . . . Mr. Usner was originally associated with Ross from early in 1915 to late in 1919, serving during part of that time as assistant manager. . . . After an interim of 18 years he returned to the company in 1937 as factory manager, was elected a director in 1939 and vice-president in 1941.

•

State Will Not Accept Dimout Claims

THE California State Board of Control has decided that the state cannot assume liability for highway accidents resulting from dimout regulations. . . . The Board recently rejected a claim of $50,000 filed by a Los Angeles man for injuries to himself and the death of his wife in a highway accident between Los Angeles and Newport Beach. . . . The claimant contended that the accident occurred because signs warning of a curve and intersection were not sufficiently illuminated during a dimout.

NO TIME FOR BEARING FAILURES!



LINK-BELT

ROLLER BEARINGS

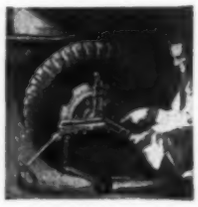
• War-time loading of trucks and buses calls for the self-aligning features, extra-capacity and flexibility of this bearing. It adjusts itself to service over bad roads and stands up under severe punishment. For front wheels, differentials and rear axles.

Made by the makers of the famous Link-Belt Silverstreak Timing Chain.

LINK-BELT COMPANY

519 N. Holmes Ave., Indianapolis, Ind.

Warehouses in all principal trading centers



How to Protect SYNTHETIC TIRES!

The one and only sure way of protecting synthetic tires is to correct the chassis defects responsible for the wheels not rolling true. If you would like to know how to go about it, send for circular: "How to Lend a Helping Hand to Synthetic Tires."

Micro-Linor Service Corporation
1625 West Fort Street
Detroit 16, Mich.

WRITE FOR CATALOG

MICRO-LINOR
Patented "Tracer-Wheel" Principle

South Africa Has Transport Troubles, Too!

THIS country has no monopoly on highway transportation difficulties, as is evidenced in a report by South African authorities that motor vehicle operation in the Union of South Africa is threatened with disruption owing to shortages of vehicles, parts, gasoline and rubber.

In an effort to deal with this situation, the Union has established the National Road Transportation Council with an advisory committee representative of the principal groups involved. Wide powers have been delegated to the council with a view to obtaining maximum efficiency from all motor vehicle use.

I.C.C. Accident Reports

(*Continued from page* 80)

28.6 percent; "device became unhitched", 21.4 percent, and "king-pin broke", 14.3 percent. Only one passenger-carrying vehicle, a house-trailer, was reported as being involved in an accident due to failure of the coupling device.

In a summary of the property damage and casualties resulting from accidents due to coupling device failure, it was revealed that in this type of accident all the vehicles were reported as moving when the coupling device failed. There were no fatalities involved in this type of accident and only two injuries. The property damage per accident was only slightly higher than the property damage per accident for all mechanical defect accidents.

Broken down by type of coupling device, the property damage per accident for accidents involving failure of the fifth-wheel was $883, which is somewhat more than $200 more than the property damage per accident for all mechanical defect accidents.

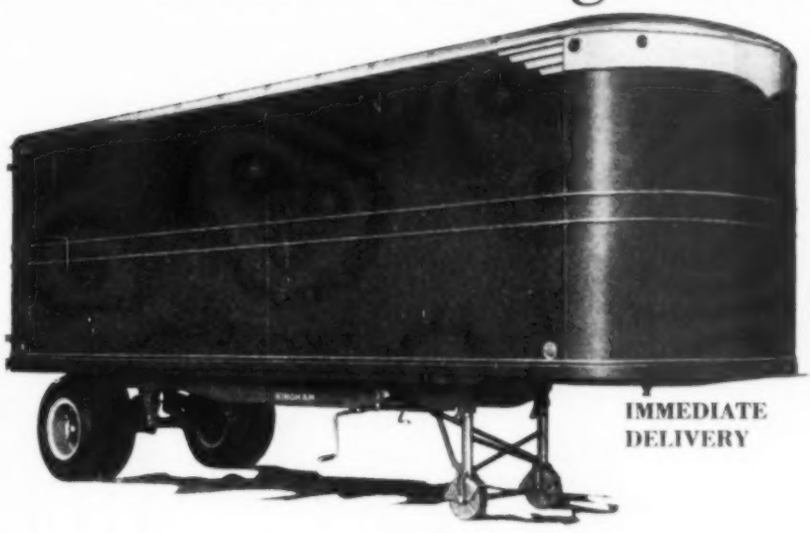
The property damage per accident for the towbar (truck-full-trailer combinations) type was $863. Because of the fact that vehicles in drive-away operations have no cargo and are themselves comparatively low in value, as compared to property-carrying vehicles, the towbar (drive-away) type of failure resulted in the lowest property damage per accident ($207), or all accidents in which coupling devices are an element.

•

Changes in Studebaker's Sales Staff

STUDEBAKER announces the following wartime changes among certain members of its sales staff: M. S. Brooks is now acting sales manager, during the absence of general sales manager, C. S. Fletcher, who is Director of Field Development for the Committee for Economic Development. . . . A. J. Chanter and Paul R. Davis have been designated assistant sales managers, in addition to their jobs as regional managers of Studebaker's Boston and Atlanta regions, respectively.

Now! NEW TRAILERS Below Ceiling Prices!



IMMEDIATE DELIVERY

120 TO BE SOLD AT ONCE

We have in our stock pile at Louisville approximately 120 brand new dependable, light-weight Kingham-Universal Trailer Vans that must be disposed of immediately. Sizes range from 20 ft. to 28 ft. long. All have new Pre-War Tires! If you need additional trailer equipment for essential war hauling don't fail to get our unusually low price on these units. Remember, this lot of 120 brand new trailers MUST be sold at once. . . . Below ceiling prices.

Take Advantage of This Unusual Offer Today!
Write, Phone or Wire!

A CERTIFICATE OF TRANSFER (PD-321) IS NECESSARY

NATIONAL SALES Kingham UNIVERSAL NATIONAL SERVICE

"A load behind is a trip ahead"

KINGHAM TRAILER CO.
INCORPORATED
LOUISVILLE . . . . . KENTUCKY

EFFICIENT!
War and Peacetime MAINTENANCE PROGRAMS Demand Air Compressors!
AUTOMOTIVE MAINTENANCE PROGRAM
Brunner H-7533—Four cylinder, 3 h.p. Compressor...completely assembled and fully automatic! Air pressure 150 lbs.

Automotive mechanics, both civilian and in the armed forces, who are keeping transportation rolling through the fierce fire of total war, are playing vital roles for a happy and prosperous tomorrow. The fact that many vehicles that would be scrapped in peacetime must be kept in service, is teaching them a valuable lesson in maintenance efficiency and economy that they will apply to good advantage when peace comes.

They have all been working under extra maintenance burdens because of the inability to make replacements of both equipment and tools. They know *what* equipment, in a service maintenance program, must have added stamina to carry extra heavy loads. They know that air compressors are the lungs of *every* maintenance program—that no other individual item is of greater importance—or must carry greater loads—and that an air compressor must be able to "give" at all times.

Many of these automotive mechanics know from experience that Brunner Air Compressors are specially designed for hard automotive service—that they have stood up under gruelling war-time service and that they are easy on operating budgets.

Brunner Air Compressors are designed in sizes to meet all automotive requirements whether it be for ¼ or 10 horsepower—single or two stage—horizontal or vertical. Their outstanding features and operating advantages are described in our illustrated catalog. Write for a *free* copy today.

BRUNNER MANUFACTURING COMPANY
UTICA, NEW YORK, U. S. A.

ARMY E NAVY
BRUNNER
For over 36 years the Symbol of Quality

SAVE A TEAR-DOWN JOB

WONDER SEAL
repairs
CRACKED BLOCKS
CYLINDERS
VALVE PORTS

Copyright 1938
Quick Acting! It works in 30 minutes. Easy to Use! No special equipment or training needed. Write for folder.
OFTEN IMITATED . . . NEVER EQUALLED!
A WONDERWELD PRODUCT
MILLER MFG. CO.
DEPT. K • CAMDEN, N. J.

Much Highway-User Tax Diversion in 1942

DIVERSION of highway funds to non-highway purposes accounted for $204,165,000 of receipts from state imposts on highway users during the calendar year 1942, the Public Roads Administration reports. This compares with the diversion of $215,039,000 in state highway-user taxes in 1941 and $196,579,000 in 1940.

State motor vehicle tax receipts used for non-highway purposes in 1942 included $146,649,000 diverted to state general funds; $15,781,000 for unemployment or destitution relief; $31,526,000 for education and $10,209,000 for other purposes.

IT'S *Easy* TO FLARE
BUNDYFLEX
Original Equipment
COPPER COATED METAL TUBING
WITH OUR
FLAREMASTER *Portable* FLARING TOOL
Gives You a DOUBLE-STRONG double-lap FLARE

NG Thin, Weak SINGLE FLARE
OK Smooth, Heavy DOUBLE FLARE
Makes the standard 45° double-lap flare used in the automotive, aviation, refrigeration and other fields, on steel, copper, aluminum and Monel metal tubing. Comes in sturdy wooden tool box.
Ask Your Jobber
EVERHOT PRODUCTS CO.
2055-59 W. Carroll Ave., Chicago 12, U.S.A.
BUY WAR BONDS

The Cure FOR SPOTTY TIRE WEAR

When tires show wear in spots, it's a sign that the wheel assembly is heavier at the places where the spotty wear occurs. The remedy is to balance the wheels with L & H Weights—a precaution that will repay its cost many times over in lengthened tire life.

WRITE

for wall chart showing how unbalance wears out tires.

HARLEY C. LONEY CO.
16873 Wyoming DETROIT 21, MICH.

L&H Wheel Balancing Weights

Net total receipts from state imposts on highway-users in 1942 amounted to $1,315,717,000, of which $538,910,000 was spent on state highways; $3,042,000 on state parks and forest roads and $33,817,000 for state highway police.

State highway bonds and notes accounted for $122,680,000 and reimbursement obligations consumed $30,944,000 of the total state highway-user imposts. In 1942 local roads and streets received a total of $341,777,000 from state motor vehicle taxes. Adjustments and expenses of collection of administration accounted for the remainder of the state taxes collected from highway users in 1942.

Thousands of "KING" TESTING UNITS are working for Uncle Sam!

For many years "KING" Testing Equipment has been sold and used in Repair Shops in every state in the union and many foreign countries. For the past couple of years our expanded facilities have been utilized almost exclusively for making testing equipment for the Armed Forces. For this reason it is impossible to supply "KING" Testing Equipment as we have in the past. We are able to supply a limited number (within our quota) of certain units to those having the required priorities. You may ask your Jobber for available items.

Ask Your Jobber or Write Us

The ELECTRIC HEAT CONTROL Co.
9129 INMAN AVENUE • CLEVELAND 5, OHIO
GOOD "KING" PRODUCTS SINCE 1914

START and DRIVE

By using Aviex products regularly in the engines of your fleet, you lose no time "warming up", with slow idling. Aviex oils keep engines completely lubricated in cold weather. There's a film of oil on all of the vital engine parts, no matter how long it has been idle. Starting wear is eliminated, there's less drain on the battery. You just start and drive.

Many leading truck, bus and cab fleets are saving time and money by conserving their equipment with Aviex. They are finding that it

- **Smoothes up engines—Aviex licks carbon, gum, sludge and varnish.**
- **Cuts down very materially engine maintenance and overhaul costs.**
- **Produces more miles per gallon of fuel.**
- **Cuts down Oil changes—Only necessary to change oil when it becomes dirty.**
- **Greater Oil Economy—Aviex produces a better piston seal in each cylinder and the oil goes farther.**

AVIEX—a pure petroleum product—is an "oiliness" concentrate extracted and processed from pure Pennsylvania crudes. It is completely soluble in all lubricating oils. Easy to use. You simply add Aviex Crankcase Motor Oil to your regular engine lubricating oil and Aviex Motor Tune-up Oil to the fuel. Then, they both go to work. Your engines are taken care of from top to bottom, where temperatures on a cold day may range from the heat of a blast furnace to that of an icicle.

Use Aviex Products regularly in your operation. It will save you time, money and manpower.

Full particulars on request.

UNITED STATES AVIEX COMPANY
NILES MICHIGAN

THE ULTIMATE IN LUBRICATION

Nothing Cleans CARBURETORS FUEL PUMPS, DIESEL INJECTORS, ETC. *Like...*

GUNK H-S

Hydro-Sealed Carbon Gum Digestive Solvent

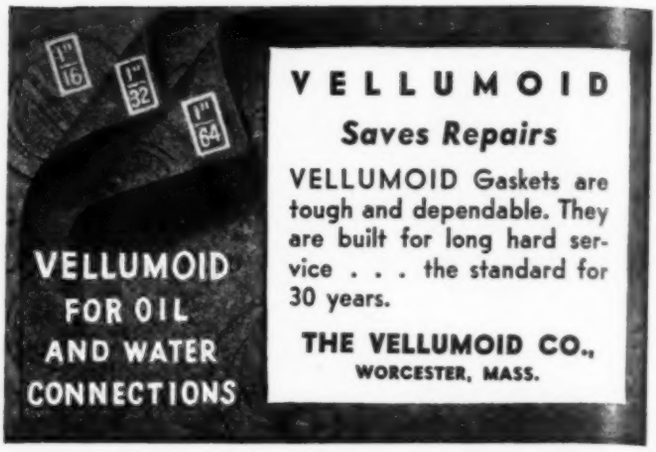
★ Available in handy steel kit containing steel dunking screen and dryer basket.
★ Rinses easily with dry cleaning solvents or water.
★ The only complete decarbonizing process in package form.

DECARBONIZES

DIESEL FUEL INJECTORS	AIRPLANE ENGINE PARTS AND SPARK PLUGS
ALUMINUM PISTONS	ANTI-AIRCRAFT GUNS
HEAT TRANSFER UNITS	OIL COOLERS

Send for Catalog Sheet

FOR CARBON CLEANING—SPECIFY...
GUNK H-S HYDRO-SEALED CARBON DIGESTIVE SOLVENT
★ IMMEDIATE DELIVERY
5 Gallons or a Tank Car
Mfg. Chemists MALDEN MASS.
CURRAN CORPORATION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VELLUMOID FOR OIL AND WATER CONNECTIONS
VELLUMOID
Saves Repairs
VELLUMOID Gaskets are tough and dependable. They are built for long hard service . . . the standard for 30 years.
THE VELLUMOID CO.,
WORCESTER, MASS.

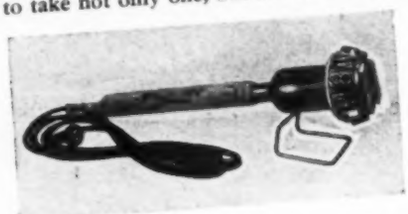
Car Age Creates Serious Maintenance Job

THE PROBLEM of war-worker and other essential civilian passenger transportation threatens to be more greatly aggravated by maintenance needs of private automobiles in the future.

Recent information compiled by the Public Roads Administration from representative sample surveys throughout the county shows that the average age of all cars on the road today is 6.4 years—counting 1942 models as one year old. Fifty-four and one-half percent of all cars on the road today are more than five years old.

OPA Gets Tough on Tires!

NEW truck tire inventories are now *lower* than ever! . . . OPA's Central Inspection Stations must now *re-examine* every truck tire, *before* it can be replaced with a new one! . . . This means that you are going to use present tires *much* longer than you ever imagined—they will have to take not only one, but *several* recappings!



BETTER make *your own* tire "inventory" *now*—before it's too late! See where you stand on tires. The truck tire picture will be bad for a *long* time.

THE Everhot Brander (above) and Everhot's Tire Record System *(free to users)* are both still available, to help you over the rough spots.

Everhot is now devoting its efforts to helping fleet operators keep rolling. . . . A penny post-card will bring the complete story, as well as free sample tire record cards.

Everhot MFG. COMPANY
MAYWOOD, ILL.

TREAT YOUR OWN GAS WITH "OX'O"

Used by Fleet Operators Since 1934

OX'O-GAS solution, added to *any* gasoline, will improve combustion efficiency, increase power and improve fuel mileage, up to 33%. . . . It also eliminates carbon-knock and keeps carbon to a minimum.

THESE are not mere claims. Ask us to show *actual* test data from important fleets. . . . OX'O-blended gasoline is available at many pumps in the New York area. . . . Or, you can blend the gas in your own tanks.

STRETCH YOUR MILEAGE CUTS WITH "OX'O"

One Gallon of OX'O will Treat 400 Gallons of ANY Gasoline. The Price Is $5.00 per Gallon, Delivered — $3.50 per Gallon in 5 and 55-Gal. Drums.

GASOLINE IS AMMUNITION — USE IT WISELY WITH OX'O

OX'O-GAS Company, Palisades Park, N. J.

The average age of all light passenger-cars (type generally used for worker transportation) in operation is 7.3 years; the average age of medium weight cars is 4.5 years and the average age of heavy passenger automobiles is 4.6 years. PRA classifies automobiles weighing 3,000 lbs. or less as "light," 3,001 to 3,500 lbs. as medium and from 3,501 lbs. up as heavy automobiles.

Only 3.2 percent of passenger automobiles now in operation are 1942 models; 14.8 percent are 1941; 11.6 percent are 1940; 9.2 percent are 1939; 6.6 percent are 1938; 12 percent are 1937 and 10.9 percent are 1936 models.

---

1 scrapped valve — 1 bead of Stoody 6 — 1 regrind on deposit

*** * * and you have a reclaimed valve with three to four times the life of a new factory replacement at ¼ the cost.**

This folder outlines the simple procedure any garage or shop equipped with acetylene welding equipment can follow. Eliminate your worries about valve replacements and save money as well—Write for folder "Weld New Life Onto Worn Valves With Stoody 6"—no obligation.

STOODY COMPANY
1133 WEST SLAUSON • WHITTIER, CALIF.

STOODY 6 - THE METAL THAT ADDS EXTRA MILES TO EXHAUST VALVE LIFE!

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THIS new, compact, portable Weidenhoff Model 1019 Engine Analyzer is ideal for all-around checking of motor vehicle engines and automotive electrical systems (6 and 12-volt systems).

Operating current supplied by battery in vehicle or outside battery. Equipped with voltmeter, tachometer, ohmmeter, ammeter, cam angle meter, breaker motor for coil testing, variable spark gap, compression tester, vacuum gauge, timing light, shunt leads for voltage regulator tests and all necessary leads and fittings neatly contained within the unit.

•

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Furnished now to the Armed Forces—To Service Stations when the Victory's Won.

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You certainly can . . . in fact, in addition to dissolving rust and scale, RUST MASTER* prevents further rust and improves the action of anti-freeze*.

LET *RUST MASTER* PRODUCTS WINTER PROOF YOUR CARS, TRUCKS, TRACTORS, ETC.

For car conservation, use RUST MASTER, the perfect rust preventive; SIX MASTER, the perfect chemical tune-up; LEAK MASTER, the newest and improved patented stop-leak.

Today, we are in a position to deliver the goods both on the War Front as well as on the Home Front. Order from your jobber at once. Rust Master may be used with any alcohol or standard anti-freeze.

For easy winter starting and winter proofing, use 10 oz. Six Master bottle in Crank Case: for easy shifting of gears make your transmission grease 5% Six Master: Leak Master prevents leaks and saves anti-freeze.

No Muss... No Fuss—Just Pour... No More

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THE SILENT PARTNERS OF MOTOR EFFICIENCY

The DIRECTIONAL *Signal System* with Finger Flip Control

Signals Visible over 125 feet Day or Night from All Directions.

Today the safe, on-time delivery of loads counts for success in our war effort—all the way to the battle lines. Accidents to men and trucks must be avoided. *Protect your drivers and equipment. Eliminate the dangerous risk of inadequate hand signals. Teleoptic Signal Systems* are scientifically correct—the product of 20 years experience in the progressive development of directional signals. A specific set of signals for every type of truck, including four signal lights. Finger-Flip control switch and tell-tale, flasher unit and junction-fuse block. Inexpensive—Easily Installed. 700 sets now available without priorities for installation on trucks not previously equipped with directional signals.

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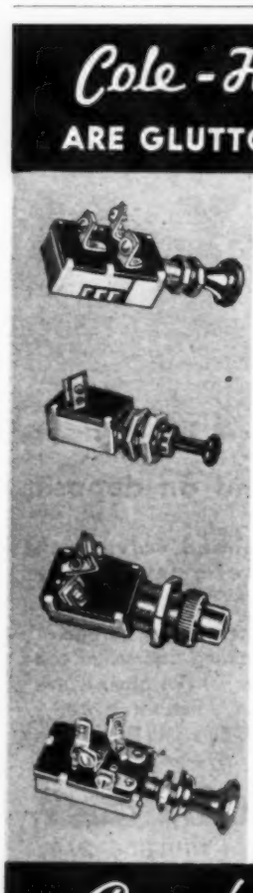
THE TELEOPTIC COMPANY
718 Marquette Racine, Wis

Cole-Hersee SWITCHES ARE GLUTTONS FOR PUNISHMENT



UTILITY LITE SWITCHES — SEE CATALOG PAGE 3

MAGNETO SWITCHES — SEE CATALOG PAGE 16

MOMENTARY SWITCHES — SEE CATALOG PAGE 18

3-POSITION SWITCHES — SEE CATALOG PAGE 3-13

***A Few Quality* COLE-HERSEE PRODUCTS**

- Dash Lamps
- Dash Switches
- Dimmer Switches
- Door Switches
- Fog and Driving Light Switches
- Fuse Blocks
- Headlamp Assemblies
- Headlamp Switches
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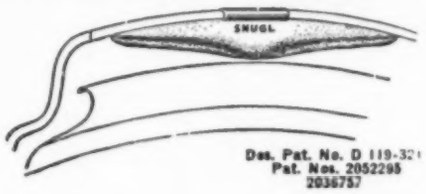
- Hydraulic Switches
- Ignition Lock Switches
- Ignition Terminals
- Junction Blocks
- Line Connectors
- Magnetic Solenoid Starter Switches
- Momentary Switches
- Pilot Lights
- Plugs
- Push-pull Switches
- Sockets
- Starter Switches
- Stop Light Switches
- Switch Knobs
- Toggle Switches
- Trailer Connectors
- Trouble Lamps
- Windshield Wiper Switches
- Wire Terminals

Cole-Hersee Company
54 OLD COLONY AVE. BOSTON 27, MASS.

RECAP USERS MUST NOW BALANCE EVERY WHEEL!

(Not by Government Order, but Only Because It's Good, Sound, Common Sense)

"USERS of recapped tires (and who isn't a user today?) must see that *every* wheel assembly is in balance, because 90% of them are out of balance sufficiently to cause excessive tire wear," says a noted authority on this subject.



FLEETS have found from experience that "Snugl" balance weights are *best* for the job. . . . They do *not* come off; steel against steel and the dove tail clip assures that. . . . Made only by us and available in *all* vehicle sizes from ½ to 32 oz.

Write for Free Chart Showing Contours and Thickness of Truck Wheel Flanges

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